# Legacy of US Nuclear Testing in the Marshall Islands

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Marshall Islands

June 30, 2006 marks the 60th anniversary of start of US nuclear testing in the Marshall Islands. Between 1946 and 1958, the United States conducted 67 nuclear tests in the Marshall Islands, all of which were atmospheric. The most powerful of these tests was the BRAVO shot, a 15-megaton device detonated on March 1, 1954, at Bikini atoll. The BRAVO shot alone was the equivalent to 1,000 Hiroshima-sized bombs. There were 17 other tests in the Marshall Islands in the megaton range. The total yield of the 67 tests was 108 megatons, the equivalent yield of more than 7,000 Hiroshima bombs. The total yield was also 93 times the total yield of atmospheric tests conducted by the United States at the Nevada Test Site. The total yield of the 67 tests is the equivalent yield of 1.6 Hiroshima-sized bombs fired every day for 12 years in the Marshall Islands.

In July 1998, the US Center for Disease Control estimated that 6.3 billion curies of radioactive iodine-131 was released to the atmosphere as a result of the testing in the Marshall Islands. To this day, the people of Rongelap Atoll, the inhabited island closest to the ground zero locations, remain in exile.

The 177 agreement under the Compact of Free Association between the United States and the Marshall Islands was based on a study done by the Department of Energy called the 1978 Radiological Survey of the Northern Marshalls, which was presented to the Marshallese as the definitive study on the full extent of damages in the Marshalls. Since the negotiation of the Compact of Free Association and the 177 agreement, the United States Department of Energy has released additional information previously classified, revealing information was withheld during negotiations from Marshallese negotiators, American negotiators and Congress that would have prevented the agreement had the full extent of the damage of nuclear weapons testing been known. Under a provision in the Compact of Free Association, the Republic of the Marshall Islands has filed a Changed Circumstance Petition with the United States, but it has not yet been negotiated.

In July 2005, the National Academy Sciences released the Biological Effects of Ionizing Radiation (BEIR) VII Report, reaffirming the conclusion of the 1990 BEIR V report that every exposure to radiation produces a corresponding increase in cancer risk.

In April 2006, Harvard Law Student Advocates for Human Rights issued a report entitled "*Keeping the Promise: An Evaluation of Continuing U.S. Obligations arising out of the U.S. Nuclear Testing Program in the Marshall Islands*." The report concludes that, despite good-faith efforts on both sides, negative effects directly attributable to the United States testing

have not yet been rectified. Most notably, some Marshallese are still unable to return to their homelands because of contamination, and many victims stricken with radiation-related cancers will receive partial compensation or no compensation at all. The report also finds that basic treatment for nearly all radiation-related cancer victims is subject to the discretionary and at times arbitrary decisions made by government officials and foreign hospitals because the Marshall Islands lacks the facilities and expertise to treat such conditions. Without US support, cancer victims with five-year survival rates below 50% are refused funding for treatment and left with no chance of being cured.

**Radiation Experiments**

Following its nuclear testing program, the United States conducted radiation experiments on Marshall Islanders under the guise of a program called Project 4.1. From 1961-1966, physicians conducted radiation experiments utilizing the radioactive agents chromium-51 and tritium on the survivors of Bravo and the other people of Rongelap and Utrik who lived in those contaminated settings. Formerly classified correspondence among the researchers, their offhand remarks preserved for posterity, had been freely available on the internet until 2004. In one letter from 1961 regarding the tritium-labeled water studies to determine total body water, Dr. Robert A. Conard, the director of medical research at Brookhaven, suggests, "I suppose we could try it on the unexposed people."

**Missile Defense**

After years of Inter-Continental Ballistic Missile (ICBM) testing, the Marshall Islands now has the dubious distinction of hosting the US government's missile defense testing program at lands leased by the US Army on Kwajelein Atoll. The US launches interceptor missiles at incoming ICBMs launched from Vandenberg Air Force Base in California to test the ability of these interceptors to track and destroy incoming missiles. Marshallese efforts to seek a clear understanding of the consequences of the missile testing program – data needed to make informed decisions regarding their future or the prerequisite rehabilitation of their lands before repatriation – have been spurned by the US government. Perchlorate additives in the missiles fired from Kwajalein have been detected in the soil and the water lenses, but to date no real data has become available for meaningful, independent study.

The people of Kwajalein have been removed from their homelands, crowded onto a 56-acre island with 18,000 residents called Ebeye. The US Army base depends on Ebeye for its indigenous labor force. However, people living on Ebeye are rationed only four hours of electrical power per day. They are unable to use the world-class hospital in emergencies, to fill water bottles during times of drought, or to purchase basic food supplies when cargo ships are delayed.

**Nuclear Claims Tribunal**

In June 1983, a formal Agreement between the Government of the United States and the Government of the Marshall Islands for the Implementation of Section 177 of the Compact of Free Association was entered into. In that agreement, the U.S. recognized the contributions and sacrifices made by the people of the Marshall Islands in regard to the Nuclear Testing Program and accepted the responsibility for compensation owing to citizens of the Marshall Islands for loss or damage to property and person resulting from that testing.

Under the 177 Agreement, the United States provided to the Marshall Islands the sum of $150 million as a financial settlement for the damages caused by the nuclear testing program. That money was used to create a fund intended to generate $270 million for distribution over a 15 year period with average annual proceeds of approximately $18 million per year through the year 2001. These funds were distributed among the peoples of Bikini, Enewetak, Rongelap,

Utrik, for medical and radiological monitoring, and the payment of claims.

The 177 Agreement also provided for the establishment of a Claims Tribunal with jurisdiction to "render final determination upon all claims past, present and future, of the Government, citizens and nationals of the Marshall Islands which are based on, arise out of, or are in any way related to the Nuclear Testing Program."

The Marshall Islands Nuclear Claims Tribunal was established in 1988. In 1991, the Tribunal first implemented a compensation program for personal injuries deemed to have resulted from the nuclear testing program. By the end of 2003, the Tribunal had awarded more than $83 million in compensation for such injuries with additional compensable claims being filed on a regular basis. In addition, the Tribunal has awarded over $1 billion in property damage awards in the class actions of the people of Enewetak Atoll and the people of Bikini Atoll. The pending property claims from the peoples of Rongelap and Utrik Atolls near completion, while the people of Ailuk Atoll have recently filed a class action claim for compensation.

With only $45.75 million made available for actual payment of awards made by the Tribunal during the first fifteen years of the Compact, today, the Nuclear Claims Fund is nearly bankrupt. It has become clear that the original terms of the settlement agreement are manifestly inadequate.

## Claims

### Personal Injury Claims

Pursuant to §23(13) of the Marshall Islands Nuclear Claims Tribunal Act 1987, as amended, the Tribunal adopted regulations in August 1991 establishing a list of 25 medical conditions which are irrebuttably presumed to be the result of the Nuclear Testing Program. Those regulations were amended by the Tribunal and approved by the Cabinet of the Republic of the Marshall Islands in January 1994 to add two additional conditions (numbers 26 and 27 below) to the presumed list. Effective October 1, 1996, the regulations were again amended by the Tribunal and approved by the Cabinet to include seven additional conditions (numbers 28-34 below). Based on a 1996 report from the Radiation Effects Research Foundation entitled Studies of the Mortality of Atomic Bomb Survivors, bone cancer was added to the list in 1998 (number 35 below). Autoimmune thyroiditis was added to the list in 2003 (number 36 below).

For eligible claimants, the administratively presumed medical conditions and the amounts of compensation for each that will be paid in pro rata annual payments are as follows:

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| 1 | Leukemia (other than chronic lymphocytic leukemia) | $125,000 |
| 2 | Cancer of the thyroid | |
| | a. if recurrent or requires multiple surgical and/or ablation | $75,000 |
| | b. if non-recurrent or does not require multiple treatment | $50,000 |
| 3 | Cancer of the breast | |
| | a. if recurrent or requires mastectomy | $100,000 |
| | b. if not recurrent or requires lumpectomy | $75,000 |
| 4 | Cancer of the pharynx | $100,000 |
| 5 | Cancer of the esophagus | $125,000 |
| 6 | Cancer of the stomach | $125,000 |
| 7 | Cancer of the small intestine | $125,000 |
| 8 | Cancer of the pancreas | $125,000 |

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| 9 | Multiple myeloma | $125,000 |
| 10 | Lymphomas (except Hodgkin's disease) | $100,000 |
| 11 | Cancer of the bile ducts | $125,000 |
| 12 | Cancer of the gall bladder | $125,000 |
| 13 | Cancer of the liver (except if cirrhosis or hepatitis B is indicated) | $125,000 |
| 14 | Cancer of the colon | $75,000 |
| 15 | Cancer of the urinary tract, including the urinary bladder, renal pelves, ureter and urethra | $75,000 |
| 16 | Tumors of the salivary gland | |
| | a. if malignant | $50,000 |
| | b. if benign and requiring surgery | $37,500 |
| | c. if benign and not requiring surgery | $12,500 |
| 17 | Non-malignant thyroid nodular disease (unless limited to occult nodules) | |
| | a. if requiring total thyroidectomy | $50,000 |
| | b. if requiring partial thyroidectomy | $37,500 |
| | c. if not requiring thyroidectomy | $12,500 |
| 18 | Cancer of the ovary | $125,000 |
| 19 | Unexplained hypothyroidism (unless thyroiditis indicated) | $37,500 |
| 20 | Severe growth retardation due to thyroid damage | $100,000 |
| 21 | Unexplained bone marrow failure | $125,000 |
| 22 | Meningioma | $100,000 |
| 23 | Radiation sickness diagnosed between June 30, 1946 and August 18, 1958, inclusive | $12,500 |
| 24 | Beta burns diagnosed between June 30, 1946 and August 18, 1958, inclusive | $12,500 |
| 25 | Severe mental retardation (provided born between May and September 1954, inclusive, and mother was present on Rongelap or Utirik Atolls at any time in March 1954) | $100,000 |
| 26 | Unexplained hyperparathyroidism | $12,500 |
| 27 | Tumors of the parathyroid gland | |
| | a. if malignant | $50,000 |
| | b. if benign and requiring surgery | $37,500 |
| | c. if benign and not requiring surgery | $12,500 |
| 28 | Bronchial cancer (including cancer of the lung and pulmonary system) | $37,500 |
| 29 | Tumors of the brain, including schwannomas, but not including other benign neural tumors | $125,000 |
| 30 | Cancer of the central nervous system | $125,000 |
| 31 | Cancer of the kidney | $75,000 |
| 32 | Cancer of the rectum | $75,000 |
| 33 | Cancer of the cecum | $75,000 |
| 34 | Non-melanoma skin cancer in individuals who were diagnosed as having suffered beta burns under number 24 above | $37,500 |
| 35 | Cancer of the bone | $125,000 |
| 36 | Autoimmune thyroiditis | $12,500 |

**Property Damage Claims**

Also pending before the Tribunal are many claims for damage to property. The large class action claims for the peoples of Enewetak, Bikini, Rongelap and Utrik were given priority over individual land damage claims. The Tribunal has issued its decision in the claims of the people of Enewetak and the people of Bikini. The pending claims in Rongelap and Utrik near completion. The people of Ailuk have recently filed a class action claim for property damage. It is the view of the Tribunal that resolution of these class action claims will provide precedent for the determination of the remaining property damage claims.

On April 12, 2006, the people of Bikini Atoll filed a lawsuit against the U.S. Government in the U.S. Court of Federal Claims. The lawsuit seeks compensation under the Fifth Amendment to the U.S. Constitution for the taking of their property damage claims resulting from the U.S. Government's failure and refusal to adequately fund the March 5, 2001 order of the Nuclear Claims Tribunal. Alternatively, the people of Bikini seek damages for the U.S. Government's breaches of its fiduciary duty to provide just and adequate compensation for the taking of their lands in consideration for their agreement to move off Bikini Atoll and for the breach of the implied duties and covenants integral to that agreement, the Compact of Free Association, and the Section 177 Agreement. The lawsuit will seek compensation and/or damages of at least $561,036,320 (which represents the Tribunal's original award to the Bikinians of $563,315,500 less the two payments totaling $2,279,180), plus interest as required by law. The total with interest on the filing date of April 11, 2006, is approximately $724,560,902.

Establishment of a Radiation Protection Standard

A major category of damage in the class action property claims is cleanup and rehabilitation of the atolls and islands involved. The Tribunal consolidated the class action property claims then before it and set a formal hearing date in November 1998 to consider establishing a radiation protection standard upon which it would rely in considering claims for such cleanup and rehabilitation of islands and atolls that remain contaminated as a result of the Nuclear Testing Program."

Among the expert witnesses who testified at the November hearing was Mr. Allan Richardson, recently retired Associate Director for Radiation Policy with the U.S. Environmental Protection Agency (EPA). Mr. Richardson provided a copy of a memorandum from EPA clarifying guidance for establishing cleanup levels for radioactive contamination at U.S. sites.[i] The memorandum states that "All remedial actions . . . must be protective of human health and the environment" and that "Cleanup should generally achieve a level of risk within the $10^{-4}$ and $10^{-6}$ carcinogenic risk range based on the reasonable maximum exposure for an individual."

The memorandum notes that EPA has determined that the cleanup level of 25 millirem per year established by the U.S. Nuclear Regulatory Commission (NRC) in 1997 (equivalent to approximately $5 \times 10^{-4}$ increased lifetime risk) with exemptions allowing dose limits of up to 100 millirem (equivalent to $2 \times 10^{-3}$ increased lifetime risk) would not properly protect the public.

Claimants also entered into evidence a 1985 document issued by the International Atomic Energy Agency (IAEA) which states "As a basic principle, policies and criteria for radiation protection of populations outside national borders from releases of radioactive substances should be at least as stringent as those for the populations within the country of release."[ii]

In December 1998, the Tribunal issued a Memorandum of Decision and Order in which it stated that the IAEA principle "whereby the victims of a transboundary exposure are treated no less

favorably than the citizens of the offending country, is consistent with the Tribunal's policy of comparability with U.S. policies and procedures" in its personal injury compensation program. The Tribunal extended that principle to the situation in the Marshall Islands where the U.S. conducted nuclear testing. The Tribunal determined that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly known as Superfund) governs the cleanup of hazardous waste sites in the U.S. such as the Nevada Test Site and that if the Marshall Islands were in the U.S., both CERCLA and the EPA cleanup guidance standard would apply to them.

The Tribunal Decision concluded by adopting the "policies and criteria" set out in the 1997 EPA memorandum which provides that "If a dose assessment is conducted at the site then 15 millirem per year (mrem/yr) effective dose equivalent (EDE) should generally be the maximum dose limit for humans." That standard will provide the basis on which evidence will be presented to the Tribunal for it to determine the need for and cost of radiological rehabilitation of any atolls where such action may be warranted.

**Conclusion**

The United States must extend its hands to assist the people of the Marshall Islands to extricate themselves from the legacy of the nuclear age and the burden of providing testing grounds for nuclear weapons, missiles, missile defense and radiation experiments.

[i] EPA memo dated Aug 22 1997 entitled “Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination.”

[ii] See IAEA Safety Series No. 67, Assigning a Value to Transboundary Radiation Exposure.