KEEPING THE PROMISE

AN EVALUATION OF CONTINUING U.S. OBLIGATIONS ARISING OUT OF THE U.S. NUCLEAR TESTING PROGRAM IN THE MARSHALL ISLANDS

HARVARD LAW STUDENT ADVOCATES FOR HUMAN RIGHTS

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Cover
A Rongelapese man fishes for food on a temporary visit to his traditional lands on the contaminated atoll of Rongerik. Photo by Adam Watkins, June 2003.

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I. EXECUTIVE SUMMARY AND RECOMMENDATIONS

At the dawn of the Cold War, the United States chose the Marshall Islands as testing grounds for its nascent but powerful atomic bomb program. From 1946 until 1958, military scientists tested 67 nuclear devices with the equivalent explosive yield of 1.6 Hiroshima bombs *per day* for those twelve years. The testing program exposed the people of the Marshall Islands to radioactive fallout and contaminated nearby atolls, rendering them uninhabitable. To compensate the Marshallese for their sacrifices and hardships, the United States has provided some ad hoc payments and in 1986 created a $150 million Nuclear Claims Fund, intended "to provide, in perpetuity, a means to address past, present and future consequences of the Nuclear Testing Program."

Twenty years later, the Fund is nearly bankrupt, raising the question: *Has the United States fully remedied the harms of the nuclear testing, and if not, what else must it do?*

Based on a year of research, field work and interviews, Harvard Law Student Advocates for Human Rights concludes that, despite good-faith efforts on both sides, negative effects directly attributable to the U.S. 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 U.S. support, cancer victims with five-year survival rates below 50% are refused funding for treatment and left with no chance of being cured.

Finally, the report concludes that the United States has assumed the obligation – under both international law and bilateral agreements – to provide just and adequate compensation for the nuclear testing program's damages to the people and property of the Marshall Islands.

Earlier this month, the U.S. House of Representatives voted unanimously to "commend[ ] the people of the Republic of the Marshall Islands for the contributions and sacrifices they made to the United States nuclear testing program."[1] The United States can fully repay the Marshallese for these sacrifices only by adopting specific remedies designed to adequately compensate those who bore (and in many cases continue to bear) the testing program's effects.

Accordingly, this report offers a balanced list of recommendations which are appropriately tailored to the harm of the U.S. Nuclear Testing Program. Congress should take a number of actions specific to the legacy of the testing:

1) To address personal injury:

- Authorize and appropriate funds necessary to replenish the Nuclear Claims Fund to the extent needed to complete payments on outstanding personal injury compensation awards, excluding those "second-generation" claimants who were not yet born (or in utero) upon the completion of nuclear testing;
- Authorize and appropriate funds necessary to replenish the Nuclear Claims Fund to the extent needed to provide required compensation for future claimants who were alive (or in utero)

during the testing period but who have yet to manifest or be diagnosed with a compensable condition.

2) To address property damage and remediation:

- Authorize and appropriate funds necessary to satisfy awards by the Nuclear Claims Tribunal to Enewetak and Bikini, Rongelap and Utrik (decisions pending), and other atolls (to be decided via the administrative process being devised by the Tribunal);
- In the alternative, authorize and appropriate adequate funds directly to the Department of Energy to remediate Bikini, Rongelap, and the northern islands of Enewetak to the point where the reasonably maximally exposed individual will receive no more than 15 mrem above background radiation per year, and authorize and appropriate adequate funds to compensate the peoples of Enewetak, Bikini, Rongelap and Utrik directly for hardship and past and future loss of use of their homelands;
- In the alternative, confer jurisdiction upon the U.S. Court of Appeals for the Federal Circuit to review judgments of the Nuclear Claims Tribunal, empowering the court to modify such judgments and enter order for payment.

3) To address health concerns of nuclear-affected populations:

- Authorize and appropriate funds sufficient to guarantee off-island referrals for treatment of those patients who were alive (or in utero) during the testing period and who are diagnosed with a compensable radiogenic condition that cannot be adequately treated in the RMI, including nearly all types of cancer;
- Specifically authorize and appropriate funds for the Section 177 Health Program at its original Compact of Free Association level of funding;
- Specifically authorize and appropriate funds for the ongoing function of the Department of Energy health and environmental programs.

II. BACKGROUND: U.S. NUCLEAR TESTING AND RELATIONSHIP WITH THE MARSHALL ISLANDS

Located in the Western Pacific and spread over 750,000 square miles, the Republic of the Marshall Islands (RMI) is composed of 1225 islands[2] with a total land area about the size of Washington, D.C.[3] Colonial control of the Marshall Islands passed from Spain in the fifteenth century to Germany in the nineteenth century to Japan in the early twentieth century.[4] The United States wrested the Marshall Islands from the Japanese in 1944[5] and assumed control of the country; in 1947, the RMI became part of the United Nations-created Trust Territory of the Pacific Islands, with the United States as Trustee.[6]

In 1986, the Compact of Free Association established the RMI as an independent nation freely associated with the United States.[7] The U.S. and RMI governments agreed to an amended version of the Compact (sometimes called 'Compact II') in 2003, which came into effect on May 1, 2004.[8]

The Marshall Islands also currently hosts the U.S. Army's Ronald Reagan Ballistic Missile Defense Test Site (Reagan Test Site). Because of its location and sophisticated radar instrumentation, the Reagan Test Site is "a premier asset" for U.S. military programs testing both offensive and defensive missile systems.[9]

A. The U.S. Nuclear Testing Program

In January 1946, U.S. officials selected Bikini Atoll in the northwest Marshall Islands for the testing of nuclear weapons.[10] After evacuating the 167 Bikinians, the United States conducted Operation Crossroads, its first post-World War II nuclear tests, consisting of two nuclear detonations in and above Bikini's lagoon.[11] Two years later, the United States added Enewetak Atoll to its testing program, moving its 145 residents to Ujelang Atoll.[12] In 1952, the United States detonated the world's first hydrogen bomb, which vaporized the Enewetak island of Elugelab, leaving a crater more than a mile in diameter.[13]

On March 1, 1954, the United States detonated Bravo, the first test in the series dubbed Operation Castle, despite "an unexpected shift in wind conditions."[14] At 15 megatons,[*] Bravo was approximately 1000 times stronger than the bomb dropped on Hiroshima, making it to this day the largest nuclear test ever conducted by the United States.[15] Due to the "unexpected" easterly winds and the weapon's high explosive yield, Bravo's fallout cloud swept from Bikini directly over a nearby Japanese fishing vessel and a number of atolls, including Ailinginae, Rongelap, Rongerik, and Utrik.[16] The resulting fireball and shock wave were so powerful that on Mejit Island, some 400 miles east of Bikini, residents startled by the blast "thought it was the end of the world."[17]

Bravo's radioactive fallout began showering Rongelap, just 100 miles from the blast site, three to four hours after the detonation.[18] One Rongelap survivor, Rinok Riklon, describes white powder falling from the sky; Riklon told our research team that children thought this radioactive fallout was actually bits of detergent and collected it for their mothers to help with the laundry.[19] On neighboring Ailinginae Atoll, eight-year-old Lijon Eknilang was gathering coconuts with her family when Bravo was detonated. When the family returned to their camp, they had trouble walking and felt very tired; the water had changed color, and fallout blanketed the food they had

[*] A detonation of one megaton has an explosive force equivalent to one million tons of TNT.

laid out to dry.[20] With no other food on hand, they wiped the fallout from the dried coconut meat and ate it, despite the now-bitter taste.[21]

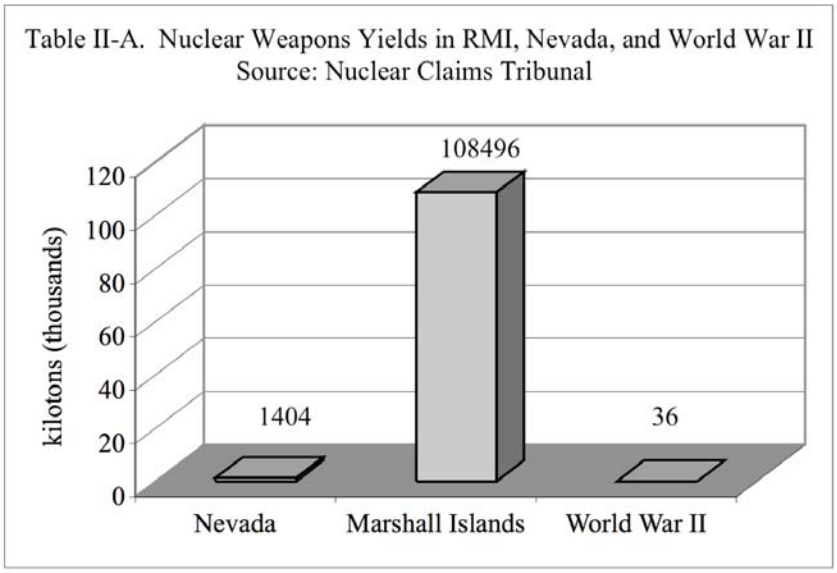
The fallout next spread over Utrik atoll, 320 miles from Bikini. Hella Ben, a child at the time, recalls:

> We heard noise like thunder and the island was shaking. I started to run around looking for my parents. … All of us thought it was the end of the world; all the kids were crying and running around. … Then the powder came. It covered our bodies and made the water foggy. … It was all so scary.[22]

By the afternoon of March 1, "a white dust" covered all exposed surfaces on the island.[23]

The United States was aware of the fallout path soon after the detonation and evacuated its personnel in the area on March 2.[24] The United States waited, however, until March 3 to evacuate Ailinginae and Rongelap and until March 4 to evacuate Utrik.[25] The Marshallese evacuees were taken to the U.S. base on Kwajalein, where U.S. medical personnel treated them for severe radiation poisoning.[26]

Table II-A. Nuclear Weapons Yields in RMI, Nevada, and World War II
Source: Nuclear Claims Tribunal



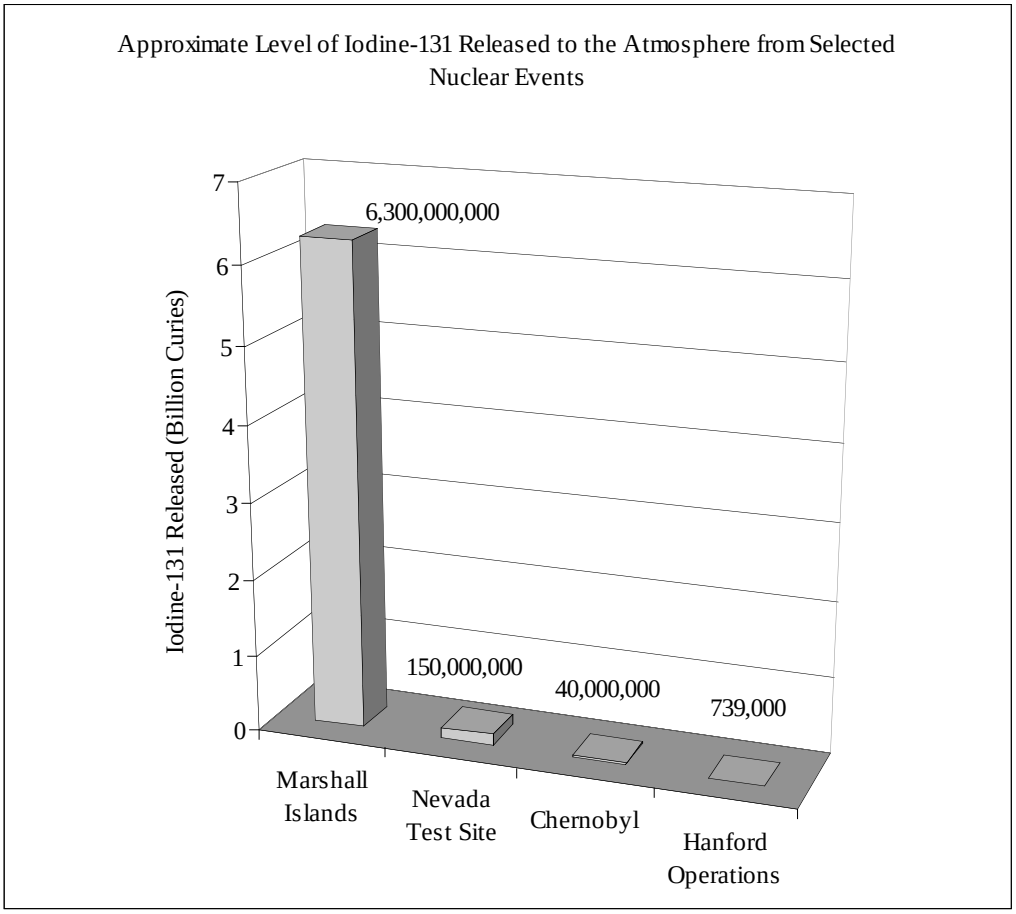
Even after Bravo, the United States conducted fifty-five more nuclear tests, with the final detonation on August 18, 1958.[27] The total yield of the sixty-seven tests was 108,492 kilotons, equivalent to the explosive force of over one hundred million tons of TNT and more than seventy-five times the total yield of the U.S. nuclear tests in Nevada.[28] (See Table II-A).

The Marshall Islands tests also produced dramatically more fallout than other nuclear incidents. According to the U.S. Centers for Disease Control and Prevention, approximately 6.3 *billion* curies* of iodine-131, a radioactive element, were released in the RMI due to the nuclear testing, an amount that dwarfs the 150 million curies of iodine-131 released through the Nevada tests, the

* A curie is a unit of radioactivity, equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second.

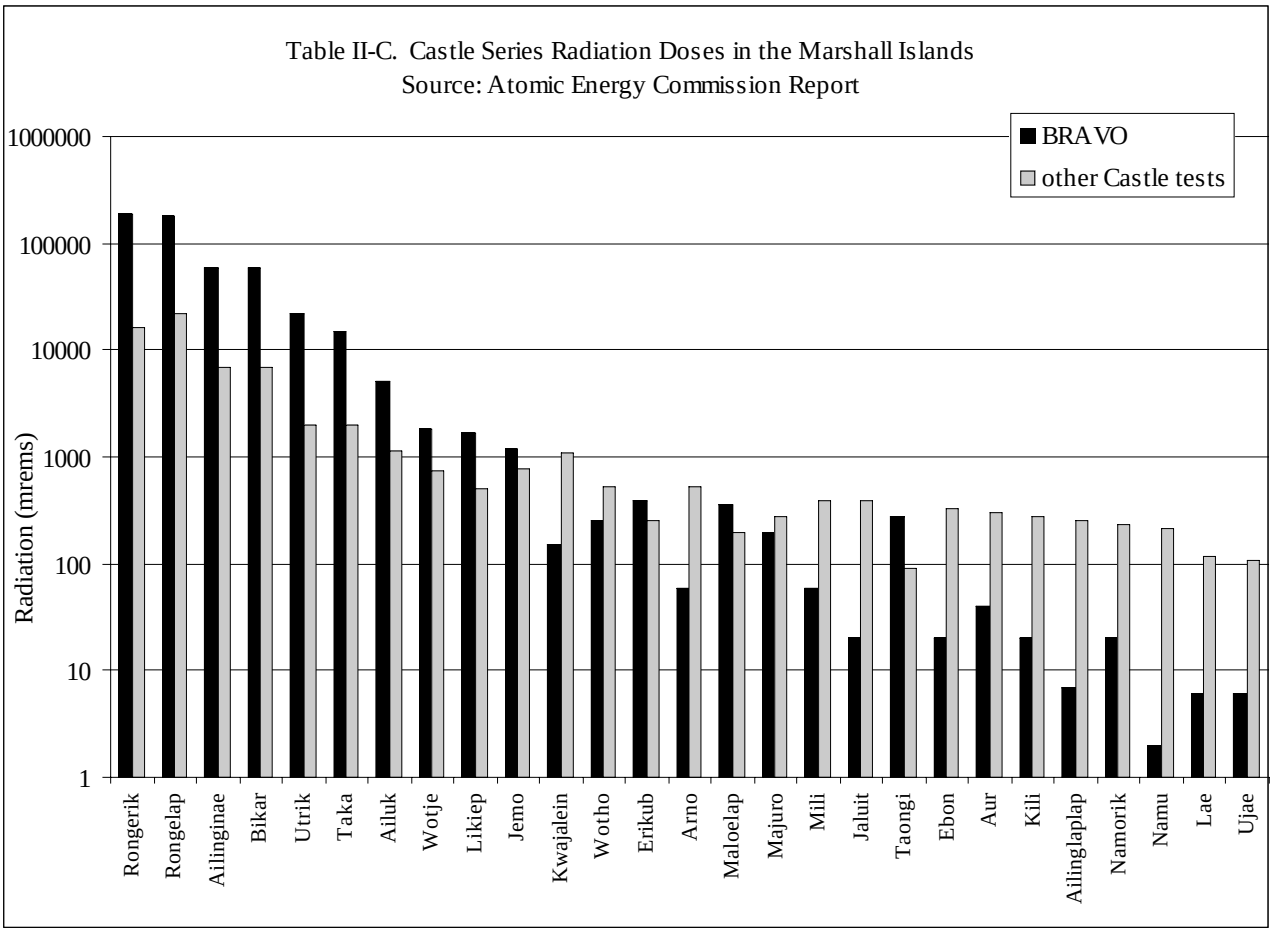
40 million curies released in the Chernobyl accident, and the 739,000 curies released in Hanford, Washington, from Atomic Energy Commission operations.[29] (See Table II-B).

Table II-B



A recently declassified 1955 Atomic Energy Commission Report documented high radiation levels on all the Marshall Islands after the Bravo test and others in its series.[30] A significant number of atolls measured received radiation doses far in excess of any recognized standard for safe limits. (See Table II-C. For a detailed discussion on determining the correct "safe" level of radiation, see Appendix C.) To put these radiation doses into perspective, the maximum radiation dose resulting from the highly publicized 1979 accident at the Three Mile Island Nuclear Generating Station was estimated to be 25 mrem,[*] less than one-thousandth of the level on Rongelap after Bravo.[31]

[*] One millirem (mrem) is equal to 1 x 10^{-5} Joules of energy absorbed per kilogram of matter.



Exposure data presented in Table II-C are only for the Castle series of tests, which represented less than half of the total explosive yield of U.S. nuclear tests in the RMI.[32] Operation Redwing in 1956, comprising 17 detonations equal to 20.8 megatons, and Operation Hardtack I in 1958, comprising 33 detonations equal to 28.0 megatons, had a combined yield greater than the Castle test series.[33] While the impact and the path of radioactive fallout from these weapons tests remains largely unknown, the contamination from Operations Hardtack and Redwing have likely further contributed to the cumulative radiation burden imposed on the Marshall Islands.

B. U.S. Legal Relationship with the Marshall Islands

i. *Compact of Free Association*

Approved by referendum in the Marshall Islands in 1983, passed by the U.S. Congress in 1985, and signed into law by President Reagan in 1986, the Compact of Free Association established the Republic of the Marshall Islands as a sovereign nation, provided a package of direct economic assistance to the RMI, and granted the United States certain military and defense rights within the RMI.[34] In section 177 of the Compact, the U.S. government "accepts the responsibility for compensation owing to citizens of the Marshall Islands … resulting from the [U.S.] nuclear testing

program" in the Marshall Islands.[35] The United States agreed to provide $150 million for a Nuclear Claims Fund, to be distributed in accordance with a separate agreement.[36]

ii. *Section 177 Agreement*

Details of the Nuclear Claims Fund's management and distribution were set forth in a separate agreement, commonly called the Section 177 Agreement because it elaborated on the terms of section 177 in the original Compact (and came into force contemporaneously). The fund was projected to return at least $18 million* per year.[37] Given this anticipated return, the agreement further broke down the disbursements of the fund to each of the affected atolls and to establish a Nuclear Claims Tribunal. (See Table II-D for a detailed description of required disbursements under the Section 177 Agreement.) The United States and the RMI agreed that the Section 177 Agreement would provide a "full settlement of all claims, past, present, and future," related to the nuclear testing program.[38]

Table II-D: Required Distributions of Section 177-Created Nuclear Claims Fund

PURPOSE OF FUNDS	RECIPIENT	TOTAL DISBURSEMENT	YEARLY DISBURSEMENT
Health care program for affected populations (Section 177 Health Program)	RMI government	$30 million	$2 million over 15 years
Medical surveillance and radiological monitoring	RMI government	$3 million	$1 million for 3 years
Loss or damage to property and person of the people of Bikini	Bikini Distribution Authority	$75 million	$5 million over 15 years
Loss or damage to property and person of the people of Enewetak	Enewetak Distribution Authority	$48.75 million	$3.25 million over 15 years
Loss or damage to property and person of the people of Rongelap	Rongelap Distribution Authority	$37.5 million	$2.5 million over 15 years
Loss or damage to property and person of the people of Utrik	Utrik Distribution Authority	$22.5 million	$1.5 million over 15 years
Establishment of a Nuclear Claims Tribunal	RMI government	$0.5 million	One-time disbursement
Operations of the Nuclear Claims Tribunal	Nuclear Claims Tribunal	$7 million	$0.5 million over 14 years
Payment of monetary awards as determined by the Nuclear Claims Tribunal	Nuclear Claims Tribunal	$45.75 million	$2.25 million for 3 years; $3.25 million for the next 12 years
	Expected Total	$270 million	$18 million per year

iii. *Amended Compact of Free Association*

In 2003, the United States and RMI agreed to a renewed Compact, which did not address nuclear issues and will gradually phase out direct economic aid in favor of increasing appropriations to a trust fund, with the goal of helping the RMI attain self-sufficiency.[39]

* Such a projection was unrealistic from the day the Compact went into effect. *See* § IV.A.i, *infra*.

III. EFFECTS OF NUCLEAR TESTING ON THE LOCAL POPULATION

A. Health Effects

i. *Radiation-Related Illnesses*

Acute and prolonged exposure to radiation caused by both immediate fallout and resulting contamination has dramatically affected the health of the Marshallese. Camilla Ingram had a tennis ball-sized tumor removed from her colon and lost twelve centimeters of the colon itself.[40] Lijon Eknilang, who turned eight on the day of the Bravo blast, has been pregnant seven times but always miscarried; often the stillborn fetuses were deformed, and one had only one eye. She herself had her cancerous thyroid removed.[41] Hella Ben had two miscarriages, including one stillborn "that looked like grapes."[42] Like Lijon Eknilang, she must take daily medication to replace the function of her excised thyroid. Hella Ben continued, "Life is short, and I don't know if I can live for another three or four years, or three or four months. . . . The U.S. has to take care of the problem fast, before the survivors die."[43]

While it is never possible to prove conclusively that a specific person's condition is radiation-related, the scientific community is increasingly able to identify the overall effects of radiation. The most recent report by the National Academy of Sciences (BEIR VII) suggests that *any* increase in radiation exposure creates a proportional increase in cancer incidence.[44] The BEIR VII reports estimates health risks from radiation to be nine times higher than the previously accepted standard announced in the BEIR I report of 1972.[45] Research conducted by Neal Palafox, a doctor with over a decade of experience in the Marshall Islands, found that cervical cancer mortality in Marshallese women is sixty times higher than in United States women, male liver cancer rates thirty times U.S. levels, breast and gastro-intestinal cancer rates five times the U.S. rate, and lung cancer threefold higher.[46]

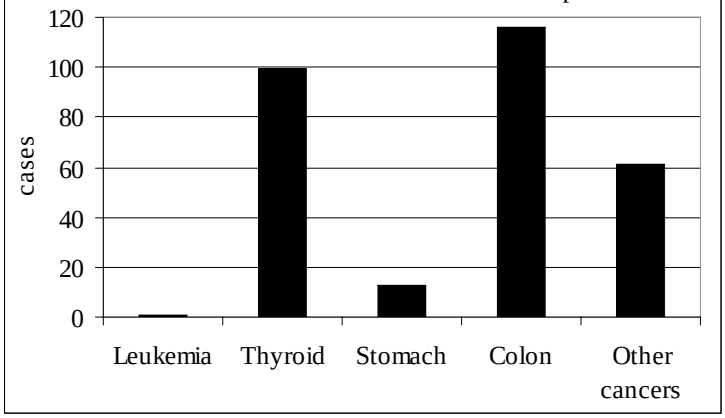
Dora Simon (shown here with her granddaughter) was on Utrik the day of the Bravo shot. She has had two thyroid surgeries, including a complete thyroidectomy in 1985. As a result she must take medication on a daily basis.

A recent report by the National Cancer Institute (NCI) estimated that among those alive in the Marshall Islands during the nuclear testing, 243 radiation-caused cancers have already occurred.[47] However, because cancers often take decades to appear, this figure represents less than half the total number of cancers caused in the RMI by the U.S. testing program.

ii. *As-Yet Undiagnosed Illnesses*

The same NCI report predicts almost 300 more cancers related to radiation fallout will appear in the exposed population.[48] Overall, about 56% of the total radiation-caused cases have yet to develop or be diagnosed as of 2003.[49] (See Table III-A). Assuming that the same past ratio of predicted cancers to awarded individuals will continue,[50] the Nuclear Claims Tribunal can be expected to provide compensation to over 2,200 additional individuals afflicted with radiation-related cancers after 2004. Unfortunately, if no action is taken to secure additional funding for the Nuclear Claims Tribunal, thousands of future claimants will not be compensated.

Table III-A. NCI Predicted Radiation-related Cancers After 2004 (by type)
Source: National Cancer Institute Report



Further, because doses were calculated from urine sample measurements taken soon after evacuation[51], NCI estimates completely ignore subsequent radiation exposure, including any fallout exposure after resettlement back to heavily exposed islands.[52] Although resettlement occurred a few decades after the initial nuclear tests (and only three months after Bravo for those on Utrik), radiation had not disappeared from the islands.[53] Rongelap was known to have significant radioactive contamination of land and local foods when the population resettled in 1957.[54] The people of Bikini were also resettled prematurely on their home island and ingested large amounts of radioactive cesium from their environment, eventually forcing the Bikinians to move off their home islands a second time as a result.[55] By ignoring radiation received after evacuation, the NCI likely underestimates the total number of radiation-induced cancers.

iii. *Lack of Healthcare*

Compounding the harm of radiation's effects, the RMI lacks the capacity to treat (or often even to diagnose) cancer victims in-country.[56] The dearth of medical specialists or adequate facilities forces the RMI to spend nearly 25% of its entire health care budget on "referrals" to hospitals in Honolulu and, increasingly, Manila.[57] The majority of these referrals are for cancer treatment.[58] Unfortunately, U.S.-funded health programs do not pay the cost of off-island referrals for the vast majority of nuclear victims,[59] and given the RMI Ministry of Health's severely limited budget, these victims are at risk of being denied necessary treatment for their radiation-related diseases.

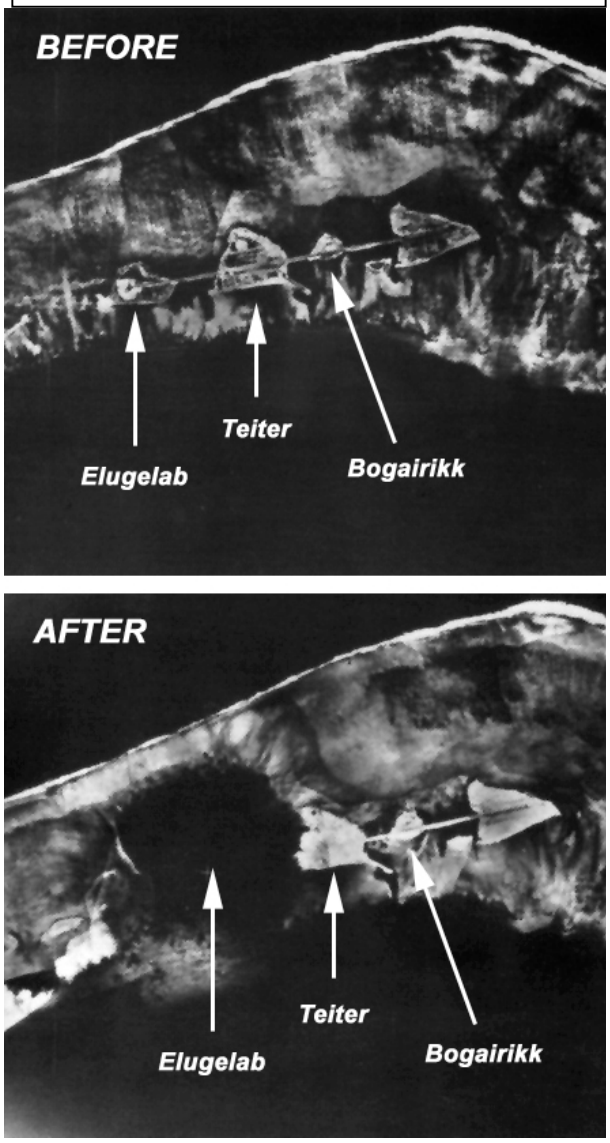
The quality of medical care on the outer islands is generally very low: most atolls have just one medical dispensary which is staffed by a health assistant with limited medical training.[60] Dispensaries are stocked only with basic drugs such as antibiotics, anti-protozoans, and pain relievers. At best, only primary and preventive care is available, and treatment is hampered by infrequent supply trips and inadequate facilities (including lack of electricity and running water).[61]

In medical emergencies, the RMI Ministry of Health pays for patients to be airlifted to the main hospital in Majuro.[62] The lack of training among outer island health assistants inevitably leads to missed and late diagnoses of conditions that do not present obvious and serious symptoms, such as cancers.

Medical care is far more modern in the RMI's urban areas. Professionally trained doctors perform basic procedures in a moderately sterile environment. However, without a radiologist, oncologist, or facilities to initiate chemotherapy or radiotherapy, cancer victims are unable to receive adequate treatment anywhere in the country, even from the programs specifically designed for nuclear victims.[63]

Thus cancer patients must be funded for treatment outside the country, and the majority can only receive funding from the Ministry of Health's Referral Committee.[64] Because of limited funds, the Referral Committee has a long list of criteria that a patient must meet to be sent off-island for treatment. Most notably, the committee turns away patients with a five-year survival rate below 50% and those older than 70.[65] Additionally, the committee's $100,000 payment cap per person has in some cases prompted recipient hospitals to refuse treatment due to concerns that medical costs will exceed the cap.[66] Recent budget cuts have further reduced the number of referrals the RMI can afford.[67] Even those patients who receive a funded referral from the Ministry of Health must still pay for their plane fare, as well as their housing and living expenses while abroad. Camilla Ingram, who was referred to a Honolulu hospital to have a tennis ball-sized tumor removed from her colon, had to live in Hawaii for eleven months for her first round of treatment; she will also have to pay to return to Hawaii for her quarterly checkups, with an average cost of more than $1,000 per roundtrip ticket.[68]

Figure III-B. Northern Enewetak Atoll Before and After 'Mike' Detonation



B. Property Effects

The U.S. nuclear tests fundamentally reshaped many of the atolls, including vaporizing entire islands. (See Figure III-B.) Many of the islands are still too

contaminated for their inhabitants to return home. The resulting displacement and loss of land has been profoundly disturbing for a people that identify very strongly with their land.

i. *Displacement*

The people of the most affected atolls have a long history of evacuations and relocations due to the U.S. nuclear testing program. The Bikinians were moved to Rongerik Atoll in March 1946, when the U.S. military took over their islands for Operation Crossroads.[69] In March 1948, conditions of extreme hardship and starvation forced the Bikinians to move to a campsite on Kwajalein,[70] then to uninhabited Kili Island.[71] The lack of a lagoon on Kili rendered fishing and sea-faring nearly impossible for six months out of the year; this inability to gather food in the traditional manner had profound consequences on Bikinian culture and daily life.[72] In 1972, the U.S. Atomic Energy Commission declared Bikini safe for resettlement, but less than six years later, the population was re-evacuated when U.S. officials found the radiation increase in the people "incredible."[73] There is no permanent settlement on Bikini to this day.

The U.S. military evacuated the people of Enewetak to Ujelang Atoll in 1947 in anticipation of nuclear testing on Enewetak.[74] After being exiled on Ujelang for twenty-eight years, the Enewetakese began a phased resettlement in 1975.[75] As of 2006, the northern islands of Enewetak are still off-limits to settlement because of contamination.[76]

The people of Rongelap and Utrik left their atolls two and three days after Bravo, respectively, and stayed temporarily on Kwajalein. After three months on Kwajalein, the Utrikese were repatriated (and have lived continuously on Utrik since then), and the Rongelapese were moved to Majuro Atoll.[77] Upon receiving clearance from U.S. authorities, the Rongelapese returned to their atoll in 1957,[78] but left again in 1985, fearing continued contamination.[79] As Lijon Eknilang, a Rongelap survivor, told one member of our research team, "I really do miss my home. I want to go back, and if they said I could go back today, I would get up and leave. We are not in our home now."[80]

ii. *Continued Contamination*

Radiation from the U.S. nuclear testing continues to render many of the atolls dangerous, even uninhabitable. The Nuclear Claims Tribunal considers 15 mrem to be the acceptable annual limit for radiation exposure, above which habitation is dangerous, while the Administration argues that 100 mrem is the correct standard.[81] While this report concludes that 15 mrem is the more appropriate guideline,[*] under either standard, radiation exposure levels on Bikini, Rongelap and the northern portion of Enewetak are so high that they are currently unfit for human habitation.[82]

For example, of the 1,919 acres of the Enewetak atoll, only 815 acres (42%) were returned to the Enewetakese for use upon repatriation.[83] Nuclear testing vaporized 154 acres, and the remaining 950 acres were too contaminated for resettlement.[84] Before the U.S. nuclear testing, the northern Enewetak islands had the highest population density in the atoll because of their larger land area and better reef system.[85] These northern islands remain uninhabitable, however, and the Enewetakese were resettled to the southern islands, with less land area and more dangerous waters.[86] Since resettlement, several people have lost their lives trying to move between and among the southern islands of Japtan, Medren, and Enewetak.[87] Because of the rough waters and

[*] For a detailed discussion of this debate, see Appendix C.

inferior reef system in the southern part of the atoll, Enewetakese sometimes fish around the contaminated northern islands in order to have enough food. "We know that the northern part of the atoll isn't safe," says Enewetak Mayor Jackson Along, "but where else can we go?"[88]

Figure III-C. Runit Dome, Enewetak.

The U.S. government attempted to "clean" the remaining islands of Enewetak atoll during the 1970s by bulldozing the contaminated land and debris into a 350-foot wide crater that had been formed by an earlier nuclear test on Runit Island.[89] The United States filled this crater with 111,000 cubic yards of radioactive soil and debris and capped the crater with cement.[90] The U.S. government then resettled the Enewetakese near this massive nuclear storage facility (known as the Runit Dome, see Figure III-C), which is unmonitored and poses unknown risks to the Enewetakese.[91]

While the Enewetakese have resettled a portion of their atoll, the peoples of Bikini and Rongelap continue to live in exile from their homelands, unwilling to return again to unsafe levels of radiation.[92] Recent radiological surveys confirm that by any standard, dangerous levels of radioactive cesium-137 still contaminate Bikini, Rongelap, northern Enewetak, and Rongerik.[93] For a fuller discussion of current contamination levels, see Appendix C.

In order to restore these lands to a condition appropriate for use, the soil needs to undergo some combination of three costly processes of remediation.[94] One alternative involves removing the remaining contaminated soil (an estimated 1.9 million cubic yards on Enewetak alone); a second is to treat the contaminated soil with potassium to counteract the presence of the radionuclide cesium; lastly, through a process called phytoremediation, plants may be used to strip the soil of radioactive elements.[95] However, insufficient funds have prevented these procedures from being completed.

C. Loss of Land: Effects on the Communities

"I long for my homeland; I want to be buried there when I die."
– Betty Edmond, a Rongelap survivor.

Though many cultures have customs built around specific connections to the homeland and particular landscapes, the Marshallese are exceptionally tied to their islands, with "an almost mystical attachment to their land." [97] For the Marshallese, "[l]and is not just a place to live and

grow food; land in the Marshall Islands is the essence of life. In a country with only 70 square miles of land, land is the most valued commodity."[98] This section examines the effect of loss of land on communities in the RMI by looking at the example of the people of Enewetak.

Social hierarchy is organized around land ownership; Enewetakese derive social authority based on their particular land parcels.[99] Contemporary hereditary practices, customs, and death rituals all continue to involve the land of the islands itself.[100] The Enewetakese essentially identify themselves with the land on which they live, viewing the land as "a part of one's very person."[101] In fact, before the Enewetakese were officially allowed to return to their island, the United States permitted dying Enewetakese to return because it was so important to them to die on Enewetak land.[102]

The Enewetakese had to restructure their society while in exile in Ujelang because of the inherent differences in the islands. Enewetak has a lagoon sixteen times larger than Ujelang's, a coral reef system seven to times as extensive as Ujelang's, and four times the land area of Ujelang.[103] In contrast, Ujelang is rocky and covered with coral rubble from a former typhoon.[104] There were bouts of famine during the Enewetakese stay on Ujelang, which not only threatened – and sometimes took – lives, but also frayed the educational and cultural fabric of their society; during famines, the schools closed because every hand was needed to hunt for food.[105]

The separation from their home also produced severe psychological effects on the Enewetakese. After witnessing from afar the 1952 Mike test on Enewetak (the world's first thermonuclear detonation), the people worried that their own atoll might not have even survived the blast, creating a feeling of aimlessness and alienation.[106] Only after 1971 did the Enewetak people finally know for sure that their atoll still existed, though they then also learned that some islands had been vaporized by the tests.[107]

Upon returning in 1980, the Enewetakese found that their islands hardly resembled the ones they had left behind. The Americans had reshaped the islets by constructing runways and taxiways, as well as a small city that was built to support 10,000 people during the testing era.[108] Even the island's physical contours had been changed by the nuclear testing, leaving no place, for example, for the Enewetakese to beach their canoes. The nuclear testing also affected the vegetation and wildlife on Enewetak, so the Enewetakese can no longer find the materials they need to observe their traditions, like canoe building and mat weaving.[109] The United States even drew former property boundary lines incorrectly, mixing up family plots and sometimes wholly redistributing land, fundamentally disturbing the land-based Enewetak social structure.[110]

IV. SHORTCOMINGS OF U.S. EFFORTS AT REMEDIATION

The United States has attempted to remedy the damages caused by the nuclear testing through two routes: monetary compensation (including Nuclear Claims Tribunal awards) and inclusion in medical and environmental programs. It is now apparent that monetary payments to date are inadequate to compensate victims with radiation-related illnesses or to properly remediate contaminated islands. On the health front, while the Department of Energy's programs conduct cutting-edge scientific research and provide excellent treatment to a handful of people, the vast majority of nuclear victims receive only basic care and are at risk of being denied treatment altogether for some of the most serious radiological conditions, including cancer.

A. Monetary Compensation: The Nuclear Claims Fund

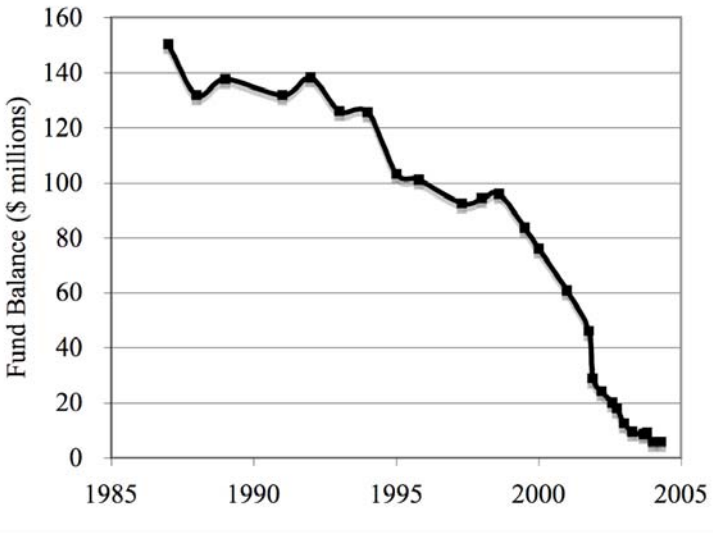
The Section 177 Agreement allocated $150 million for the creation of a Nuclear Claims Fund, requiring annual disbursements of $18 million over its first fifteen years to a number of sources.[111] (See Table II-D for a detailed summary of the disbursements). The four atolls of Bikini, Enewetak, Rongelap and Utrik received a total of $12 million per year for "claims arising out of the Nuclear Testing Program for loss or damage to property or person."[112] A total of $33 million was allocated for health care and medical surveillance.[113] The agreement also required the RMI government to establish a "Claims Tribunal" with jurisdiction to "render final determination upon" all claims arising from the U.S. nuclear testing program in the RMI.[114] The Tribunal was to receive $500,000 per year for operations and $45.75 million for payment of claims.[115]

Pursuant to the Section 177 Agreement, the RMI Nitijela (parliament) passed enabling legislation in 1988 establishing the Nuclear Claims Tribunal (NCT or Tribunal).[116] The Tribunal sits in the RMI capital of Majuro and adjudicates personal injury claims on behalf of individuals and property damage claims on an atoll-wide basis.

i. *Status of the Fund*

For the Nuclear Claims Fund to have met the mandated $270 million of disbursements over a fifteen-year period[117] would have required a 12.5% annual return.[118] Such a rate of return was unrealistic *from the day the Compact went into effect,*[119] and the Fund is now nearly bankrupt. (See Table IV-A). By the end of 2004, the Fund balance was at $3.8 million with more than $14.6 million worth of personal injury awards still

Table IV-A. Nuclear Claims Fund Balance
Source: Nuclear Claims Tribunal



outstanding.[120] The Fund balance at the end of 2005 was down to $1.9 million, while the unpaid balance on personal injury awards stood at $15.4 million.[121] Past class action property claims have each taken several years and several hundred thousand dollars in expert witness fees alone to complete. Because the Tribunal is now operating on a year-to-year basis, it "no longer has the resources to support the same level of expenditure or length of time of adjudication for outstanding property claims."[122] The Tribunal is now considering "suspending payments to certain categories of recipients, including those born after the testing period and the estates of those who have already passed away. While the Tribunal has chosen not to pursue such a strategy [in 2004], as funds become more scare, these may become painful but necessary steps to take in the future."[123]

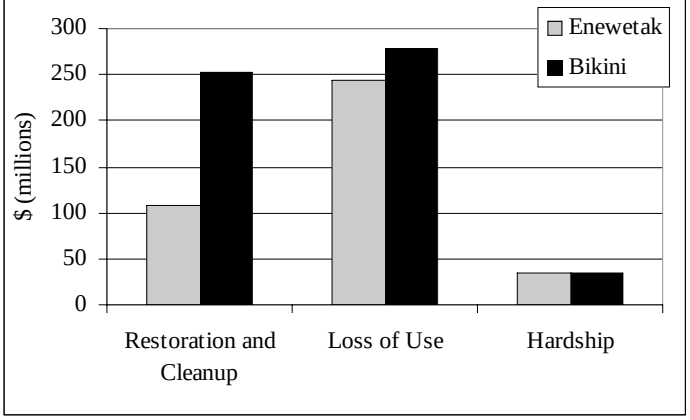
ii. *Property Damage Claims*

The Tribunal considers loss of use, restoration of property and hardship in its property award determinations, as required by the Restatement (Second) of Torts.[124] Furthermore, any awards given by the NCT are offset by prior compensation that the atoll received from the United States, including direct disbursements required by the Section 177 Agreement.[125]

After hearings in 1999, the Nuclear Claims Tribunal issued compensation for claims brought by the populations of Enewetak[126] and Bikini.[127] Property damage claimants bear the burden of proof in relating their damage to the effects of the testing program.[128] Property awards, unlike personal injury awards, include post-judgment interest.[129]

Loss of use is calculated by the rental that could have been obtained had the land been intact and available for rent at market prices.[130] While there is debate over the proper methodology for determining "market prices" in the RMI, the Tribunal's calculations represent the best estimate for what the rent most likely would have been.[*] After deducting for prior compensation from the United States, the Tribunal set past and future loss of use at $244 million for Enewetak and $278 million for Bikini.[131]

Table IV-B. Bikini and Enewetak Property Damage Awards
Sources: Nuclear Claims Tribunal



Restoration costs can include radiation cleanup, soil rehabilitation, revegetation, and resettlement.[132] The Tribunal called for soil removal and seeding the land with potassium to block cesium-137 uptake, awarding $108 million to restore and resettle Enewetak and $251.5 million to restore Bikini.[133] To compensate the Enewetak and Bikini people for hardships suffered during exile (including famine, epidemics, mental depression and cultural loss), the Tribunal awarded approximately $34 million to each atoll.[134]

[*] For a full discussion of the loss-of-use methodological debate, see § V.A.iii, *infra*.

The Tribunal acknowledged that the awards for hardships "cannot fully repay those who suffered,"[135] and referenced *Mochizuki v. United States*:

> No compensation is ever equivalent to a serious human loss. Who among us would ever trade our eyes or legs for $5,000 or $20,000 or a hundred times that much? Money damages can never undo the loss of life, false imprisonment or the passage of years. Money, however, is the medium which the law must use as it seeks to right the wrongs. It must use this medium with the full recognition that it is never truly adequate.[136]

In total, the Tribunal awarded $386 million to the Enewetak people[137] and $563 million to the Bikini people.[138] In comparison, the U.S. government has allotted tens of billions of dollars to clean up contamination at sites in the United States. (See Table IV-C).[139] Unfortunately, only a small fraction of the Enewetak and Bikini compensation has been paid. The Tribunal issued 0.25% of each award in February 2002 and an additional 0.125% in February 2003.[140] No other payments have been issued.[141]

Table IV-C. Estimated Cleanup Costs for Selected Nuclear Sites[142]

U.S. Sites	**Cleanup Cost (1998 dollars)**
Hanford Reservation	$50.3 billion
Savannah River Site	$29.7 billion
Oak Ridge Reservation	$13.1 billion
Idaho National Engineering and Environmental Laboratory	$16.3 billion
Rocky Flats Environmental Technology Site	$6.3 billion
Marshall Islands sites	**Cleanup Cost (1999 dollars)**
Bikini	$0.25 billion
Enewetak	$0.09 billion

Separate claims for property damage in Utrik and Rongelap are currently pending before the Tribunal.[143] Property damage claims for fourteen other atolls were filed during 2004.[144] In addition, there are thousands of individual property claims and several property class action claims still unresolved; their priority has been lowered in comparison to property damage claims filed on behalf of the atolls specifically included in the 177 Agreement.[145] The Tribunal is seeking to address these outstanding claims through an alternative, less formal administrative and regulatory framework.[146] Prior Tribunal decisions will provide the basis for this proposed administrative framework; instead of holding an adversarial proceeding, the court will weigh such factors as contamination levels, acreage, and historical property values to determine what, if any, compensation is due.[147]

iii. *Personal Injury Awards*

The Tribunal's personal injury compensation program is patterned closely after a compensation program established by the U.S. Congress in 1990 for U.S. civilians exposed to fallout from nuclear testing in Nevada.[148] This reflects the international legal principle that victims of radiation exposure in a foreign country are treated no less favorably than citizens of the offending country.[149] The Tribunal uses medical conditions listed in U.S. government radiation compensation programs as the basis for the medical conditions subject to compensation.[150] There are currently thirty-six medical conditions for which the Tribunal awards compensation to those Marshallese who were alive or in-utero during the nuclear testing period.[151] The Tribunal also compensates "second-generation" Marshallese – those who were born after the testing period

whose mothers lived in the RMI during testing – who are diagnosed with a listed condition, but at half the compensation rate of the first-generation exposed population.[152]

Personal injury awards do not include post-judgment interest, rendering them less valuable with each passing day of delay in full payment. On the other hand, claimants benefit from a statutory presumption that eligible conditions were caused by radiation.[153] A number of factors led the Tribunal to presume exposure for those living in the RMI during the testing period: 1) the lack of data estimating exposure levels for nearly all atolls,[154] 2) the wish to maximize the percentage of awards that went to victims, rather than their lawyers,[155] 3) a desire to promote expediency in awards so that claims could be processed before more victims died,[156] and 4) the example set by the Radiation Exposure Compensation Act (Downwinders' Act), which presumed exposure for civilians living in specified areas surrounding the Nevada Test Site.[157]

As of December 31, 2005, the Tribunal had awarded personal injury compensation totaling $88,291,750 to 1,958 individuals.[158] (See Appendix B for summary of personal injury awards.) Only $72,867,947 of that amount has actually been paid to the awardees or their heirs, leaving an unpaid balance of approximately $15.4 million.[159] The Nuclear Claims Tribunal has followed a cautious payment allocation, awarding money in annual pro rata installments; in 1991, for example, initial recipients received 20% of their awards, with additional annual payments made in subsequent years.[160] Nevertheless, the Tribunal surpassed its $45.75 million allotment for personal claims in 1996,[161] and the fund's near-bankrupt status forced the Tribunal to make annual payments of only 1%-5% of total awards in 2005.[162] As a result, more than 50% of past awardees have died prior to receiving full payment of the compensation awarded for their personal injuries.[163]

Figure IV-D. Comparison of the "affected area" in Nevada and in the Marshall Islands.

iv. *Comparison with 'Downwinders'*

Current efforts to restore the people and land of the Marshall Islands fall far short of efforts the U.S. government has made to assist Americans living downwind of the Nevada nuclear test site ("downwinders"). A comparison with the U.S. testing in Nevada (and subsequent compensation program) reveals that despite facing much higher levels of exposure and contamination, the Marshallese have actually been compensated at a lower rate. Realizing the significant disparity in the RMI's exposure and compensation by the U.S. government in comparison to their American counterparts is helpful to understanding the need to revisit the U.S. duty to the Marshallese.

With the Radiation Exposure Compensation Act of 1990 ("RECA," or the "Downwinders' Act"), Congress initiated a compensation scheme for people who were physically exposed

to nuclear fallout from the tests.[164] RECA, like the Nuclear Claims Tribunal's personal injury scheme, provides awards for claimants diagnosed with specific radiogenic conditions who live within the "affected area," which is approximately the same area as the entire Republic of the Marshall Islands ().[165]

Figure IV-E shows that while explosive yields in the RMI were more than 75 times higher than in Nevada and release of radioactive iodine-131 more than 40 times higher, RMI victims have received on average less compensation than their American counterparts.[166] A 2002 study concluded that on *every atoll* of the RMI, the average external radiation dose from U.S. nuclear testing surpassed the average level for Americans living in the six counties nearest the Nevada test site.[167] In contrast to the $72.9 million distributed to RMI victims,[168] over $1 billion has been granted to date by the Downwinders' Act on behalf of 24,266 individuals.[169]

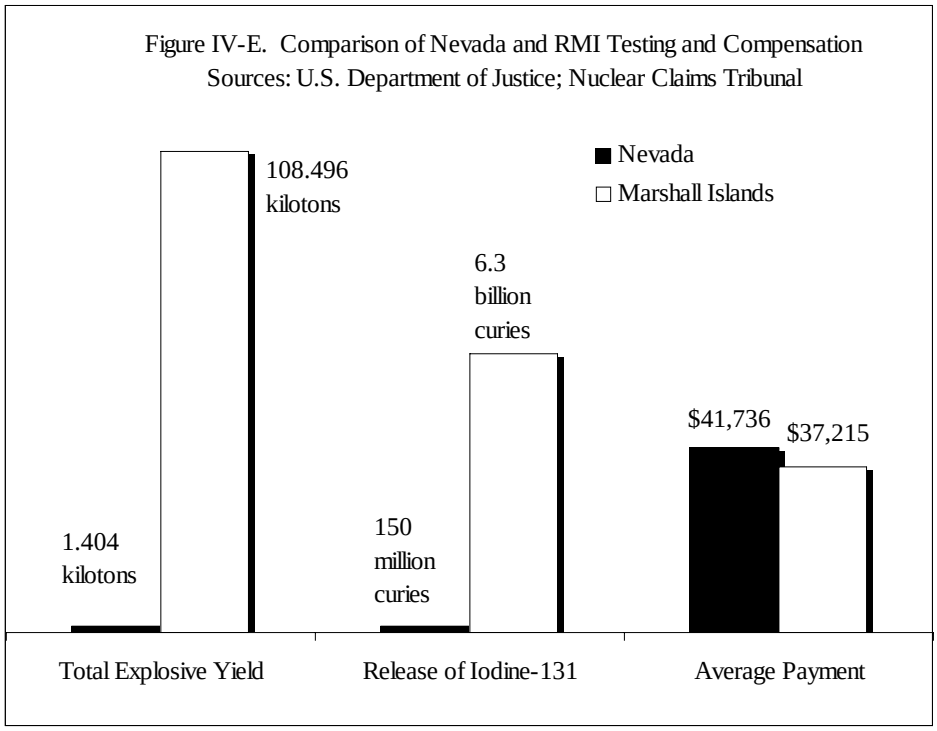


Figure IV-E. Comparison of Nevada and RMI Testing and Compensation
Sources: U.S. Department of Justice; Nuclear Claims Tribunal

B. Health and Environmental Programs

i. *Section 177 Health Program*

In 1977, as part of an aid package to its territories, the United States created what is now known as the Four Atoll Health Care Program ("177 Health Program") to provide "adequate medical care and treatment for any person who has a continuing need for the care and treatment of any radiation injury or illness directly related to" the Bravo test.[170] Finding the scope of the initial program too limited, Congress expanded it to provide coverage for direct *and indirect* effects of the *entire* nuclear weapons testing program in the RMI,[171] including coverage beyond the first generation of nuclear survivors to all descendants of those "affected by the consequences of the United States nuclear testing program."[172] The Section 177 Agreement, implemented with the Compact in 1986, provided for a $2 million annual distribution from the Nuclear Claims Fund to fund the program for the life of the Compact.[173]

By January 1988, the program's "major objective" was the "provision of primary, secondary, and tertiary health services and education to the peoples of the Four Atolls."[174] During the life of the first Compact, the program constructed clinics on Majuro, Ejit, Mejatto, Kili, Enewetak and Utrik to deliver primary care services (staffed by medical assistants with quarterly doctor visits), periodically sent specialists to the outer islands, and paid for referrals to the Majuro hospital for secondary care.[175]

The 177 Health Program continued to be funded with $2 million annual disbursements from the Nuclear Claims Fund until September 2003.[176] Facing the prospect of an end to funding, the program scaled down to focus exclusively on primary care and secured $1 million from the Nuclear Claims Fund for fiscal year 2004 operations.[177] This reduced level of funding has been maintained for fiscal years 2005 and 2006 through one-time appropriations from the U.S. Congress.[178] These budget cuts have forced the 177 Health Program to stop sending specialists to the outer islands and funding referrals to Majuro/Kwajalein or Honolulu.[179] Instead, a coordinating office and clinic in Majuro (with two physicians) is supplemented by one physician and one health assistant in residence on each atoll's primary island (Enewetak, Kili, Mejatto, and Utrik).[180] When a patient presents with a medical problem that cannot be treated on the outer island, the 177 Health Program no longer has resources to pay for the medical evacuation; the patient must instead hope that the RMI Ministry of Health agrees to pay the bill.[181]

Enrollees are quite pleased with the services provided by the 177 Health Program. Criticisms of the program are entirely funding-related: the program no longer pays for off-island referrals; the outer island facilities lack basic medical equipment (and in some cases running water and electricity); medications and supplies sometimes run out.[182] Atoll leaders and residents alike praise the fact that a doctor is now available at all times, rather than just on periodic visits.[183] One survivor with a view to the future sees the 177 Health Program as the most important aspect of U.S. assistance to the four atolls: even more important than being able to move back home in her lifetime is ensuring that her children will receive adequate medical care.[184] Because the 177 Health Program no longer pays for off-island referrals, however, the vast majority of cancer victims are not guaranteed treatment for their conditions.[185]

U.S. critics of the 177 Health Program have raised concerns about ineligible people enrolling in the program.[186] Administrators of the program have taken steps to address this issue: audits have reduced the enrollment to approximately 11,000 persons, and standards for new enrollments have

been tightened (only persons with land rights on the atoll in question are eligible, and such status requires verification by the atoll's Senator and the applicant's *alab*[*] or mayor).[187] Furthermore, the first Compact specifically allowed the RMI government to establish eligibility for coverage under the 177 Health Program.[188]

ii. *Department of Energy Programs*

The Department of Energy (DOE) program in the RMI was established soon after the Bravo detonation, primarily as "a research program" not responsible for general health care.[189] Despite individual doctors' efforts to provide expanded services unofficially, the program's research focus would contribute to the feeling among Marshallese survivors that they were "guinea pigs" and that the doctors were interested only in using them as research subjects, rather than treating them as patients.[190] As one Marshallese, Lijon Eknilang, stated plainly: "It's okay for the DOE to study my body; I have no choice but giving myself to them to use me . . . but they need to do something in return. . . . They have become very smart now; they are the head of the world. They will know what to do with the next generation if they ever make nuclear things again because they learned from us, from studying our bodies."[191]

> *It's okay for the DOE to study my body; I have no choice but giving myself to them to use me . . . but they need to do something in return.*
>
> *--Lijon Eknilang*

In 1972, the Department of Energy bifurcated its activities into a medical program and an environmental program (with the latter focused on radiological monitoring and developing remediation techniques).[192]

Currently, the Department of Energy medical program has one clinic serving each of the RMI's major population centers (Majuro and Ebeye) and sends a doctor two to four times per year to Utrik atoll and Mejatto island (the latter being the primary settlement area for the exiled Rongelap community).[193] The program's 187 enrollees[194] receive one comprehensive medical exam per year and treatment for any potentially radiogenic conditions, including guaranteed referrals for secondary and tertiary care to Majuro, Kwajalein, or Honolulu.[195] The program's doctors also provide limited preventive care unrelated to nuclear effects, such as vaccinations for children.[196]

Although the DOE medical program provides high quality treatment, some Marshallese survivors feel that the program is inadequate since coverage is limited to radiogenic conditions.[197] Survivors who are part of the DOE program are unconvinced that radiation exposure can be ruled out as a cause of many of their illnesses, and are frustrated by what they view as unjustified denials of treatment:[198]

[*] An *alab* is a traditional leader who oversees the *ri-jerbal* (working people) and reports to the *Iroij* (chief).

> How can we tell that it is from the radiation or not? … None of us understand that. I know I have all this sickness inside of me … but DOE said they would only treat me if they know the sickness is caused by radiation.[199]

Marshallese survivors also fault the program for covering only those physically present during the Bravo test, while neglecting those born later who have lived in radiologically contaminated environments.[200] However, for those few who are covered, the DOE medical program provides the gold standard for off-island referral, guaranteeing treatment for all radiological conditions.[201] Recent cuts in the program's budget have endangered the effectiveness of this program: Utrik residents report that the DOE medical visits are substantially less frequent than in previous years, increasing the likelihood that even with guaranteed referrals, cancers may be caught too late to be treated effectively.[202]

When the Compact went into effect, funding for these DOE programs was set at $6.3 million as a line item within the Department of Energy budget ($1.1 million for medical services and $5.2 million for environmental work).[203] However, this funding was removed from the budget for the 2005 fiscal year and is now wholly discretionary.[204] Congress should ensure that funding for the DOE programs is re-established as a budget line item.

V. LEGAL EVALUATION OF CHANGED CIRCUMSTANCES

While the United States has accepted responsibility for the impacts from nuclear testing and sought to provide "the means to address past, present, and future consequences of the Nuclear Testing Program,"[205] efforts to date have failed to do so. The nearly 300 Marshallese who have not yet developed, but are projected to develop, radiation-related cancers will receive little or no compensation for their suffering unless additional funding is secured. Current funds are also inadequate to address the non-health related damages to private property, including destruction and degradation that has rendered large portions of some atolls unfit for use, costs of environmental clean-up, and compensation for the hardships faced by the Marshallese.

The Section 177 Agreement between the United States and RMI includes a "Changed Circumstances" provision, which allows the RMI government to request additional funding. In September 2000, the RMI submitted such a request to the U.S. Congress. This section analyzes this issue and concludes that recent scientific developments and newly available information represent "changed circumstances" within the terms of the Section 177 Agreement. The clear intent of the Compact that the settlement be "just and adequate" requires the United States to provide additional funding.[206] In addition, failing to fully compensate the Marshallese would constitute a violation of the United States' obligation under international law to remedy harms caused by its actions to the Marshall Islands and its people.[207]

A. Legal Foundations of Changed Circumstances

i. *The Section 177 Agreement*

The Section 177 Agreement reiterates that the purpose of the Compact of Free Association, as expressed in its section 177, is "to create and maintain, in perpetuity, a means to address past, present and future consequences of the Nuclear Testing Program, including the resolution of resultant claims."[208]

Under Article X, the "Espousal" provision, the RMI agreed to terminate any legal proceedings against the United States or its agents related to the nuclear weapons program. The Article specifies that the Section 177 Agreement provides a "full settlement of all claims, past, present, and future."

Article IX of the Agreement (the "Changed Circumstances Provision") includes a clause allowing the RMI to request additional funding from Congress for loss or damage arising from the nuclear weapons testing program *if*:

1. the loss or damage is "discovered after the effective date of this Agreement,"
2. the injury "could not reasonably have been identified as of the effective date of this Agreement," *and*
3. failure to provide for these injuries would render the agreement "manifestly inadequate."

ii. *The Changed Circumstances Petition*

In September 2000, the RMI presented a petition to Congress contending that the three requirements of Article IX had been met and requesting additional funding totaling over $3 billion.[209] The request includes $14 million for unpaid personal injury awards, $949 million for unpaid property damages to Enewetak and Bikini Atolls, $50 million for medical services

infrastructure, and $45 million annually over fifty years for a health care program for those exposed to radiation. The petition also alludes to funding needs that will continue to develop in the future; for example, as other atolls' property damage awards are finalized, these claims will require additional sums. These as-yet unquantified requests for funding include an occupational safety program, community education and development programs, and a nuclear stewardship program.

The RMI argues that new information is now available on the full extent of the damages from the nuclear testing program:[210] information on the long-term health consequences of radiation exposure, the level of environmental clean-up required to ensure safe habitation, and the range and quantity of the fallout from the tests have advanced greatly since the Compact was signed in 1986, rendering prior assessments of injuries to the people and environment of the Marshall Islands incomplete and inaccurate. The petition also contends that the Nuclear Claims Fund had lower than expected investment returns, while costs of health care, medical surveillance, environmental cleanup, and radiological monitoring were higher than expected. Finally, the RMI argues that because the damages were not fully known at the time of the Compact negotiations, Congress intended to "leave the door open" to additional funding via the Changed Circumstances provision, rather than scientifically determining the full extent of damage at the time.

iii. *The Administration Response*

In November 2004, the Bush Administration issued a report rejecting the RMI claims of "changed circumstances."[211] The Administration report suggests the sums awarded for personal injury by the Nuclear Claims Tribunal were overly generous[212] and that the Tribunal gave awards that would not have been recognized by comparable U.S. nuclear compensation programs.[213] It argues the clean-up standards proposed are unnecessarily high and that all loss or damage to property was fully recognized before the ratification of the Section 177 Agreement. The Administration also notes that because the United States had no control over the management of the trust fund or the administration of the Tribunal, any changed circumstances resulting from these would not constitute "damages arising from the nuclear weapons testing program," as the language of the provision specifically requires. Therefore, the fact that the low investment returns are insufficient to meet the large sums awarded by the Tribunal would not trigger the changed circumstances provision. Furthermore, the Administration argues that the changed circumstances provision does not allow the RMI to add in any new consideration (such as a nuclear education program) to the agreement – such programs could have been included in the original agreement if the parties had so desired. The Administration characterizes the Section 177 Agreement as a "settlement," implying that the terms of the agreement are essentially decided.[214] Under the Administration's interpretation of the Agreement, the door to additional funding is closed except in the very narrow situation in which some wholly unexpected damage related to the nuclear weapons testing program is discovered.

B. Statutory Analysis: The Purpose of the Compact and Section 177 Agreement

Close readings of the statutory language and legislative history of the Compact and Section 177 Agreement demonstrate that these agreements were intended to serve dual purposes: to provide a just and adequate settlement of all claims arising from the nuclear weapons testing program;[215] and to establish a separate, independent forum for resolution of these claims within the Marshall Islands. The adequacy of the compensation amount is a necessary element of the Compact and Section 177 Agreement.

i. *The Compact's Language Suggests an Overriding Intent that Compensation Be Just and Adequate*

The plain language of the Compact expresses congressional intent that the provisions of section 177 represent a full and final settlement of claims, terminating all obligations of the United States to the injured parties, *unless* the provisions of the Section 177 Agreement necessitate otherwise: "[T]he provisions of section 177 … constitute a full and final settlement of all claims … *except* insofar as provided for in the Section 177 Agreement."[216] The termination of claims occurs as a result of – not independently of – the just and adequate settlement provided by section 177 of the Compact.

The Administration's reading of the Compact as a simple settlement of claims is incomplete; it ignores the language pointing to simultaneous obligations that arise from the Section 177 Agreement.[217] Statutory language should be given effect so as to reconcile the different provisions in a consistent and sensible manner,[218] and the Administration's interpretation ignores the Compact's language mandating a "just and adequate settlement."[219] Instead, the most consistent reading of these two sections – "full and final settlement" and "just and adequate settlement" – conditions the finality of settlement upon its adequacy.

ii. *The Structure and Language of the Section 177 Agreement Indicate a Congressional Interest in Ensuring Just and Adequate Compensation*

The language of the Section 177 Agreement further indicates congressional intent that the Agreement provide just and adequate compensation, rather than simply a lump sum settlement. The Agreement goes to the trouble to set out specific requirements in Article I – creating the Nuclear Claims Fund, specifying terms for its management, requiring the selection of a qualified fund manager, and setting specific performance objectives – that indicate an interest in ensuring adequate compensation. Specifying how the $150 million grant must be managed suggests a concern that future injuries arising from the nuclear testing program be adequately compensated. Likewise, Article IV's creation of the Nuclear Claims Tribunal, including its specification of operational rules, only makes sense as a method of fulfilling the goal of just and adequate compensation.[220] Congress chose to create a body with the jurisdiction to hear and resolve claims, rather than to extinguish the claims via a direct settlement.

The Changed Circumstances provision of Article IX perhaps most clearly illustrates congressional intent that the settlement be just and adequate. Although the additional funding is optional, the inclusion of the provision nonetheless indicates that certain funding needs would justify an increase to the original $150 million grant. This Article would be unnecessary if the purpose of the Section 177 Agreement were solely to provide a final settlement of claims. New information is only relevant if Congress intended the adequacy of the grant to compensate the victims of nuclear testing to comprise an essential element of the agreement.

Article XI, the strongest evidence of the Section 177 Agreement as a lump sum settlement, limits the indemnity of the United States to $150 million for any claims past, present, and future, brought in any jurisdiction, arising out of the nuclear testing program. Yet this article also includes the express limitation that it is "[s]ubject to Article IX" (the Changed Circumstances provision). That is, the $150 million cap on damages is only valid absent to discovery of additional damages that could justify supplemental compensation.

iii. *Legislative History Further Demonstrates Intent to Ensure Adequate Compensation*

Recognizing the uncertain state of knowledge about the nuclear testing's full effects, the Compact's congressional supporters specifically envisioned the provision of additional compensation when scientific advances showed the need, demonstrating a focus on the adequacy of settlement rather than its finality. During the debate over the original Compact, a number of Senators raised the question of the fairness of the "Subsidiary" Section 177 Agreement.[221] Senator Alan Cranston elaborated on these doubts: "These provisions, which establish a $150 million trust fund from which all claims are to be paid – an amount which may not be adequate – deny to 5,000 Marshallese, who have already filed claims, their day in court."[222]

Senator James McClure, then Ranking Minority Member of the Committee on Energy and Natural Resources, responded to these concerns directly:

> As you … know, article IX of the subsidiary contains a changed circumstance clause which would allow the Marshallese to ask Congress for relief if circumstances develop which could not have been foreseen, such as newly identified claimants.
> …
> As you indicated, there is a continuing moral and humanitarian obligation on the part of the United States to compensate any victims – past, present, or future – of the nuclear testing program. For this reason, I fully expect that if new claims develop Congress should and will provide any assistance required, absent compelling contradictory evidence.[223]

One of the Senators who had raised the initial concerns, Senator Howard Metzenbaum, responded by noting that "the record is clear that if the need for further assistance arises, nothing in the Compact will discourage the Marshallese from seeking additional money and that the Senate shall give a sympathetic hearing to these appeals."[224] Senator McClure remarked that "there is an enormous burden on Congress to state affirmatively that if future valid claims develop we will do everything possible to compensate adequately all newly-identified victims."[225]

Congressional statements support the conclusion that the Changed Circumstances provision was included in recognition of a continuing moral obligation held by the United States to the Marshallese injured by the nuclear testing program. Acknowledging the great uncertainty surrounding the extent of the damages, Congress recognized that later discoveries could obligate additional compensation. The Changed Circumstances provides a mechanism to resolve such an inadequacy.

C. Analysis of Changed Circumstances in the RMI

While the Changed Circumstances provision does not itself require Congress to act, it provides the framework enabling Congress to address changes that prevent the Compact from achieving its goal of "just and adequate" compensation. This section evaluates the existence of changed circumstances in order to determine if additional funding is justified under the terms of the Section 177 Agreement.

i. *The Definition of "Changed Circumstances"*

In essence, the Changed Circumstances provision suggests that Congress should allocate additional compensation for damages that, had they been known at the time of the negotiation of the Compact, would have required supplementary funding to reach a fair and just agreement acceptable to both parties. Three elements serve as a prima facie test of the funding request's legitimacy:[226] the

discovery of additional injuries must have been made after the date of the Section 177 Agreement; the scope of the injuries could not reasonably have been identified at the time of the Agreement; and failure to provide these remedies must render the Agreement manifestly inadequate.[227]

Discovered After 1986: The first element of "changed circumstances" is that the loss or damage must be "discovered after the effective date of this Agreement."[228] The Section 177 Agreement came into effect in 1986, and any damage that was not known until after that year would satisfy this requirement. In the context of an agreement to provide compensation for such damages, to "discover" a loss would indicate something more than to be merely aware of the possibility of a loss. Rather, a discovered loss or damage must be sufficiently specific and defined in scope so as to allow a judicial or administrative body to provide a remedy in practice. During congressional debate, for example, Senator McClure suggested that newly identified victims would fall into this category of discovered damages.[229] A discovery that radiation from the nuclear testing program impacted more Marshallese than anticipated in 1986 clearly falls within the scope of the first element. The recent National Cancer Institute Report estimating that the U.S. nuclear testing program will cause hundreds of cancers outside of Rongelap and Utrik atolls provides such evidence.[230]

Could Not Reasonably Have Been Identified by 1986: The second element narrows the scope of injuries to those that "were not and could not reasonably have been identified" at the time of the Agreement's ratification.[231] The term "reasonable" indicates a reasonable person standard: whether a reasonable person in the same position as the drafters of the agreement (Members of Congress in 1986) could infer the existence of the loss from other facts already known to him.[232] The reasonable person standard does not necessarily impute a duty to ascertain facts.[233] A positive duty to seek additional facts is commonly indicated by the term "should";[234] instead, the drafters limited the requirement to injuries that *could* have been reasonably identified.[235] Although it is not feasible to establish the exact information available to the all those Members of Congress who worked on the Agreement, the legislative record provides some evidence of the state of their knowledge in 1986. Publicly available information, such as scientific knowledge relevant to the nuclear testing program, can supplement the legislative record, as it can reasonably be inferred that such information was also available to the drafters of the legislation.

Manifestly Inadequate: The final element of damages that constitute changed circumstances is that a failure to provide for them must render the Section 177 Agreement "manifestly inadequate." Manifest inadequacy must be considered in the context of Article IX's purpose – which is to create a means to request supplementary funding – and in light of the Section 177 Agreement's dual purposes of (1) fully settling all claims arising out of the nuclear testing program, and (2) ensuring that the settlement is just and adequate.[236] Compensation may be inadequate to fully settle claims if it fails to meet a legal threshold such as the constitutionally mandated minimum of just compensation for a government taking of private property. Manifest inadequacy under the "just and adequate" clause imputes a moral standard of fairness. Whatever the standard adopted, however, providing a victim no (or de minimus) compensation for his losses would represent the clearest example of manifest inadequacy, as it would render the agreement clearly inadequate to fulfill either express purpose.

ii. *Personal Injury Claims*

The $15.4 million requested by the RMI to complete payment of already-made Tribunal personal injury awards should receive high priority for immediate funding. Furthermore, strong scientific evidence indicates several hundred Marshallese will develop cancers or other radiation-related

diseases,[237] and without additional funding these victims will go uncompensated for their injuries. The uncompensated personal injury claims meet a prima facie test of the elements of the changed circumstances provision, and the requested funds are legitimately needed to remedy the damages suffered as a result of the nuclear testing program. Provision of additional funds should be limited, however, to those alive or in utero during the nuclear testing program.[238]

Prima Facie Case: New evidence on the full scope of radiation-related health effects has emerged only recently; the latest report presenting a more accurate prediction of the number of cancers arising from the nuclear testing program was published in 2004.[239] Thus, the full extent of human health damages could only have been "discovered after the effective date" of the Section 177 Agreement. Nor could these injuries have been "reasonably identified" at that time. While there was general speculation that additional radiation-related injuries could develop in the future, the specific damages from chronic exposure that later emerged could not have been identified in 1986.[240] Finally, the failure to provide compensation to those who develop radiation-related diseases would render the Agreement "manifestly inadequate" by violating one of the primary purposes of the Agreement. These diseases result directly from the nuclear weapons testing and fall clearly within the scope of damages Congress intended to resolve through the Section 177 Agreement and the Compact.

Furthermore, there is an immediacy to these claims that requires prompt response. The pro rata system of payment mandates that each claimant collect only a portion of her award each year. The current inadequacy of the Nuclear Claims Fund has forced both the initial awards and the pro rata awards to be severely restricted.[241] This situation has resulted in over 50% of the injured Marshallese dying before being fully compensated.[242] Those who were diagnosed more recently have received substantially lower awards, and the hundreds more who will be stricken with cancer after the Nuclear Claims Fund runs out will go uncompensated absent congressional action. Such a failure to provide any compensation at all would seem the very definition of "manifestly inadequate."

Administration Critique of the Personal Injury Awards: The Administration response to the Changed Circumstances petition includes very little valid criticism of the personal injury award system. The Tribunal bases awards on several U.S. radiation compensation programs, such as the Radiation Employees Compensation Act (RECA).[243] Comparisons to RECA are illustrative of the advances in science and knowledge that necessitate additional funding to compensate radiation-related diseases. RECA itself was amended several times to expand the population of claimants and to add six types of cancer to the list of compensable diseases.[244] These amendments resulted in a dramatic increase in the number of claims filed.[245] To ensure continued funding, Congress in 2002 mandated appropriations for RECA through 2011.[246] In light of these ongoing awards and amendments of the RECA program, additional funding for the Tribunal should be viewed as perfectly reasonable.[247]

However, there is one category of personal injury awards that should be reconsidered. The Tribunal compensates those born after the cessation of the nuclear testing program who are afflicted with radiogenic conditions at one-half the award rate for first generation victims.[248] Awards to the second generation of Marshallese who were not acutely exposed to radiation are not based on sound scientific principles[249] and divert funds from first-generation victims. Additional funding granted to the Nuclear Claims Tribunal for personal injury should be limited to first-generation victims *(i.e.,* those born or in utero before the end of the testing period) unless and until scientific evidence shows radiogenic effects on second-generation victims.

iii. *Property Damage Claims*

The Tribunal's property awards are divided into three categories of compensation: loss of land use, losses due to hardship, and the cost of environmental restoration of still-contaminated land. Each of these categories of award is examined separately to consider whether additional funding is warranted under the Changed Circumstances provision. While there is some debate about appropriate standards and formulas used to calculate these awards, those used by the Tribunal better adhere to the requirements of international and U.S. law. Furthermore, under *any* proposed standards, U.S. payments to date are inadequate to compensate losses and fully resettle all islands, making further compensation required under the Compact and Section 177 Agreement,[250] and under international law.[251]

a. Loss of Use of Land

The additional funding needed to pay the balance for the loss of use of the Bikini and Enewetak atolls totals $278 million and $244 million respectively.[252] Further funding will presumably be required when the other atolls' awards are finalized. Currently less than one-half of one percent of the Bikini and Enewetak awards has been actually paid.[253] While it is not evident that there are any "changed circumstances" relating to the loss of use of land that meet the technical requirements of Article IX, under *any* loss-of-use calculation (including the formula proposed by the Congressional Research Service), the amount granted by Congress in 1986 is manifestly inadequate to compensate the victims of the nuclear testing program for their property losses.

The Compact and Section 177 Agreement explicitly mandate just and adequate compensation for *both* losses to person and property;[254] failure to provide any additional funding would be contrary to the stated objectives of the those documents. For this reason, this report recommends additional compensation for lost use of Bikini and Enewetak, as well as for lost use of Rongelap and Utrik once those decisions are issued by the Tribunal.

Prima Facie Case: The damages related to lost use of land prior to the Tribunal award ("past loss use") do not meet the technical requirements of the Changed Circumstances provision. The lost use of land between 1946 and 1997[255] is not an injury "discovered after the effective date" of the Section 177 Agreement. One could argue that such damages were not quantified as of 1986 and therefore were only "discovered" at the time these losses were conclusively measured. Yet even under such an interpretation, these damages were cognizable as of 1986. Congressional members were aware that the property damages included the loss of use of the highly contaminated atolls that would continue for some time into the future.[256] However, while full funding of past loss-of-use awards may not be justified under a strict interpretation of the Changed Circumstances provision, the United States is still obligated to act since compensation thus far is not "just and adequate," as required under the Compact.[257]

Loss-of-Use Methodology Debate: The Tribunal calculated loss of use by multiplying an annual rental value by the total affected acreage summed across the years of loss and adjusted for the time value of money.[258] The recent Congressional Research Service (CRS) report notes that this methodology is "reasonable and appropriate."[259]

Another CRS report, however, is highly critical of the Tribunal's method of calculating the annual rental values, contending it inflates rents by a factor of ten.[260] The Tribunal relied on two U.S. real estate appraisal firms to establish estimated rent levels for the period of lost use. However, because the Marshallese do not traditionally rent or lease their land, very few data points exist from which

to extrapolate a market rental price.[261] The Tribunal's experts analyzed every real estate transaction ever recorded in the RMI, fitting a trend line of annual rents to the 174 properties that most resembled the agricultural uses of rural atolls.[262] The key CRS criticism is that the Tribunal estimates are based on transactions on more urbanized atolls where rental rates in modern times have mirrored the government rate (the rental rate the RMI government is required by national law to pay private landholders).[263] The Tribunal's approach, however, is the closest approximation of actual market-based rental prices: empirical evidence shows that the government rental rate effectively serves as a floor for private rental rates even outside of urban areas, despite what market economics might prevent.[264] Other CRS criticisms are similarly overstated, as noted below in Table V-A.

Table V-A: Factors Cited for Overestimation of Loss-of-Use Property Damages

ISSUE	CRS POSITION[265]	REJOINDER
Exponential Model of Rent Growth.	Typically real estate rents reflect real estate values, and empirical evidence suggests these values do not increase exponentially over time.	The model is not strictly exponential, but rather fits a trend line to empirical data to provide the best estimate for actual rental conditions for the period of time in question.[266] To the extent that any 'market' exists in the RMI for land, rents are set by the 'market leader' – the national and local governments.[267]
Quantity of Land Affected	Failure to account for portions of the island that were vaporized. Such vaporized portions of the atoll are not temporarily unusable, and do not earn an increasing rent over the years. Instead this land should be treated as though it had been purchased at the time of its destruction.	In the RMI, foreigners are prohibited by law from purchasing land, making a market-based analysis required for determining hypothetical purchase price impossible.[268] Furthermore, no claim was made by either party at trial that the U.S. exacted a permanent taking of land.[269] Finally, given the extreme cultural ties to land,[270] it would be nonsensical to compensate destruction of land at a lower rate than contamination of land.
Value of Alternative Habitation	The value of the use of alternative atolls during periods of evacuation is assumed to be less than the value of the use of the evacuated atolls. Such an assumption is based on agricultural output of the atolls, which is inconsistent with the original assumptions of the model- that the value of an atoll is not based on its economic productivity. Additionally, the Bikini award ignores their return to the atoll from 1969 -1978, treating the value of use of the contaminated atoll as zero rather than at a reduced rate.	Agricultural output may be a proper measure of offset value because the use is not hypothetical (as loss of use on the contaminated atolls was), and actual use value may be easier to calculate.[271] From 1969-1978, Bikini was unsuitable for human habitation due to cesium-137 contamination of the food chain. The return of some Bikinians during that period is not properly considered as an offset to loss of use because of the dangerously high level of radiation.
Reinvestment of Rent	100 percent of all proceeds from past lost use of land are assumed to have been invested into US treasury bonds, an unrealistic savings rate.	Proper compensation over long periods of time requires taking into account the time value of money. U.S. Treasury bonds represent a standard rate used for this type of calculation.[272]

CRS proposes an alternative methodology to estimate the rental value of land on the contaminated atolls, though it does not calculate total loss-of-use awards based on its estimates.[273] This model is based on the agricultural outputs of the atolls and results in estimates of annual rents starting from $77 per acre in 1982 and increasing to $166 per acre in 1990.[274] While a full evaluation of the CRS methodology is beyond the scope of this report, it is important to note the CRS figure of rental

values may be significantly underestimated, as CRS itself recognized.[275] The CRS methodology gives no valuation to the environmental amenities or cultural values of the land lost by the Marshallese despite their contributions to the total economic value of the land. Given the deep cultural ties to the land in traditional Marshallese culture, it is likely that these values would be substantial and could easily be as high as the market value of farmland. CRS notes that estimates for annual rental values of the most valued environmental amenities, such as wetlands, have been quantified at up to nearly $1600 per acre,[276] while other sources put the value of wetlands at up to $60,000 per acre.[277] Furthermore, even using the CRS methodology, total compensation for property damage is likely still inadequate because of the other components that should be incorporated into the award: environmental remediation and hardship. Finally, the CRS report fails to consider the lost use of marine resources, particularly access to coral reefs (and their wildlife) which dwarfed the physical size of the land lost.[278] Legal precedent in the U.S.-administered Marshall Islands courts before independence recognized the right of landowners to obtain compensation for loss of use of such marine resources.[279]

Overall, even CRS agrees that the Tribunal's loss-of-use methodology – using market-based renal value as the basis of compensation – is proper.[280] The rent calculation formula employed by the Tribunal's real estate valuation firms is a reasonable approach that adheres to the international obligations of the United States[281], and more closely approximates actual RMI rent levels than the CRS methodology.[282] Thus, the Tribunal's loss-of-use awards are appropriate, and should be fully paid by Congress. Alternatively, Congress may grant jurisdiction to the Federal Circuit Court of Appeals to review the Tribunal awards for property damages. Such an approach presents a method of resolving this complex question of facts involved in calculating loss of use damages, and would also help ensure finality for the issue.

b. Environmental Restoration

The $360 million requested for environmental restoration of the affected atolls should receive priority for additional funding. New developments in scientific understanding of radiation protection standards[283] and knowledge of the full extent of the nuclear fallout constitute "changed circumstances" under Article IX. While there is some debate over the appropriate radiological dose limit to guide cleanup, under *any* standard – including the one proposed by the Administration – a number of islands are still unsuitable for human habitation. The Administration suggests that full resettlement of some islands should be abandoned. However, the Compact and Section 177 Agreement explicitly mandate the provision of funding so as to allow the resettlement of the affected atolls by those evacuated from their homelands.[284] Compensation has thus far been inadequate to achieve this requirement, and additional funding is therefore justified under the terms of these agreements and under international law.[285]

Prima Facie Case: Radioactive contamination of the atolls meets the elements for changed circumstances under Article IX of the Section 177 Agreement. While it was certainly recognized at the signing of the Compact that damages arising from the nuclear testing program included continued contamination, the full extent of the damages was not "discovered" until after 1986. Measurements of radioactive fallout from Bravo and others in its series were not available to the RMI until the 1990s.[286] Negotiations for the provisions of funding were conducted without full awareness of the level of contamination throughout the Marshall Islands. Furthermore, acceptable standards for environmental clean-up are far more stringent than in 1986, largely due to advances in scientific understanding of the health effects of radiation exposure.[287] Finally, the failure to provide additional funding for environmental restoration would render the Section 177 Agreement

"manifestly inadequate" by specifically violating the provisions of the Compact and Section 177 Agreement establishing that contaminated lands be remediated for resettlement.[288]

Radiation measurements on the ground also justify additional compensation. All data show that the radiation levels in at least Bikini, northern Rongelap, and northern Enewetak remain above any acceptable standard of environmental cleanup, even if the inhabitants are assumed to eat primarily imported food.[289] This cleanup can not be completed without additional funding, and failure to do so would violate the express intentions of those drafting the agreement. Under the cleanup standard adopted by the Tribunal, additional portions of Enewetak, Rongerik, and Rongelap atolls also require additional environmental restoration.[290] Since this report concludes that the cleanup standard adopted by the NCT is the more reasonable one,[291] it recommends that Congress grant the full sum awarded for environmental restoration by the Nuclear Claims Tribunal.

The Administration's Critique of Environmental Restoration Awards: The Administration denies that there are changed circumstances that can serve as a basis for a funding request for environmental cleanup.[292] The Administration, however, is factually in error when it states that the "current dose limit has been used to guide clean up decisions both before and after the Compact was enacted."[293] In fact, the Administration earlier in its report recognized that a less stringent standard was used to guide attempts to clean Bikini in 1984.[294] The Administration argues that the contaminated atolls are not wholly inhabitable, concluding that "most historically inhabited islands in the northern atolls could be resettled under specific conditions."[295] Yet these "specific conditions" include the total elimination of consumption of local foods and groundwater.[296] One of the goals of the Marshallese in returning to their traditional homelands is to be able to regain a measure of self-sufficiency and the means to economic advancement. The definition of resettlement should include the fundamental ability to pursue one's livelihood, and in rural areas this includes agricultural pursuits. The Administration's proposals to restrict activities of returning evacuees and wholly abandon some islands contradict the Compact and Section 177 Agreement's explicit calls for resettlement.[297]

Finally, even the Administration's proposed resettlement method would require additional cleanup of the northern atolls prior to resettlement. A failure to provide additional funding to effect the resettlement of the contaminated atolls would directly violate the intentions expressed in the Compact and Section 177 Agreement, even by the Administration's own standards.

c. Losses Due to Hardship

It is undeniable that the Marshallese suffered greatly as a result of the nuclear testing program. However, hardship losses do not constitute "changed circumstances" under a strict interpretation of the Section 177 Agreement. Neither the Administration nor CRS, however, has forwarded any criticism of these awards. Compensation for hardship is the smallest of the three types of property damage, totaling only $34 million for each of the atolls receiving an award.[298] Quantification of non-economic loss is always difficult to calculate, and the well-documented hardships endured by the dislocated peoples of the RMI are the likely basis for the apparent agreement that these awards are justified, despite not meeting the technical requirements of the Section 177 Agreement.

d. Additional Requests for Funding

The RMI additionally requests funds for medical services infrastructure, a revamped health care program, an occupational safety program, community education and development programs, and a nuclear stewardship program. While none of these additional requests falls within the definition of

"changed circumstances" under Article IX, in order to right the harms caused by nuclear testing effectively and efficiently, additional funding for health programs is recommended above.[299]

D. Conclusion

The ongoing development of radiation-related diseases and the remaining contamination of some atolls are clear cases of damages that meet the requirements of "changed circumstances" under the Section 177 Agreement. This report recommends that Congress honor the express intent of its earlier agreements by providing funding for these damages in their entirety and without delay.

Additionally, this report recommends that funding be provided for the loss of use of the affected atolls, though these damages may not strictly be construed as "changed circumstances." The United States is obligated under the Compact, Section 177 Agreement, and international law to provide additional funding for these outstanding property damages. Congress should fulfill its expressed commitments to provide just and adequate compensation for all personal and property losses arising from the nuclear testing program.

VI. CONCLUSION

The original Compact of Free Association between the United States and the Marshall Islands "specifically endorses [and] affirms that the governments of the parties to the Compact are founded upon respect for human rights and fundamental freedoms for all."[300] Indeed, the Compact and its associated agreements constituted a serious, good-faith effort on the part of the United States to recognize the infringements on human rights caused by its nuclear testing program in the Marshall Islands, and fulfill its obligations to remedy these harms.

Twenty years later, however, advances in scientific knowledge and experience in treating nuclear victims have demonstrated that the promise of "just and adequate" compensation has not yet been fulfilled. Radioactive fallout has caused cancer among hundreds of Marshallese, and still hundreds more are expected to be stricken in the future. Yet without Congressional action these victims will not be compensated, and may not even be able to receive treatment for their conditions.

Nearly fifty years after U.S. testing ended, the atolls of Bikini and Rongelap, and the northern islands of Enewetak lay devoid of permanent settlement, too radioactive for their people to return safely to these homelands. Though the technology now exists to clean up these islands and ready them for unfettered habitation, insufficient funding prevents full resettlement.

Less than three weeks ago, the U.S. House of Representatives, in a unanimous vote "solemnly acknowledge[d]" the cataclysmic Bravo test and "commend[ed] the people of the Republic of the Marshall Islands for the contributions and sacrifices they made to the United States nuclear testing program in the Marshall Islands."[301] Without taking action by providing adequate compensation, however, this recognition rings hollow. It is up to the current United States Congress and Administration to keep the promise of its predecessors by acting without delay to ensure that the Marshallese people are fully repaid for their sacrifices.

APPENDIX A: METHODOLOGY

This report is based on primary and secondary research conducted in the Marshall Islands between December 29, 2005, and January 25, 2006, secondary research conducted between September 2005 and April 2006. The importance of this issue came to the attention of Harvard Law Student Advocates for Human Rights (HLS Advocates) from the experiences and preliminary research in the Marshall Islands of Adam Watkins from July 2002 through June 2003 and June 2004 through August 2004, including site visits to Rongelap, Rongerik and Kwajalein Atolls.

Field research was conducted by Adam Watkins on Majuro Atoll between December 29, 2005, and January 20, 2006, and by Caitlin Daly on Utrik Atoll from January 22, 2006, to January 25, 2006. Overall, twenty-six separate interviews were conducted, including interviews with: survivors of the nuclear testing; doctors who see, diagnose, and treat such individuals; Nuclear Claims Tribunal staff; elected political leaders; and the head of the U.S. Department of Energy's Marshall Islands Program.

Interviews Conducted in the Marshall Islands

1. Bill Graham, Public Advocate, Nuclear Claims Tribunal, Majuro, December 30, 2005.
2. Jack Niedenthal, Bikini Atoll Trust Fund Liaison, Majuro, December 30, 2005.
3. Bill Graham, Public Advocate, Nuclear Claims Tribunal, Majuro, January 4, 2006.
4. James Matayoshi, Rongelap Atoll Mayor, Majuro, January 4, 2006.
5. Ishmael John, Enewetak Atoll Senator, Majuro, January 4, 2006.
6. Dr. Terry Hamilton, Marshall Islands Program Director, Lawrence Livermore National Laboratory, U.S. Department of Energy, Majuro, January 5, 2006.
7. Joe Saul, Utrik Atoll Mayor, Majuro, January 5, 2006.
8. Eldon Note, Bikini Atoll Mayor, Majuro, January 6, 2006.
9. Hiroshi Yamamura, Utrik Atoll Senator, Majuro, January 6, 2006.
10. Dr. Virgilio Villaroya, Nuclear Claims Tribunal Diagnostician, Majuro, January 11, 2006.
11. Dr. Gael Laviña, Physician and Administrator, Section 177 Health Program, Majuro, January 12, 2006.
12. Mike Slinger, Enewetak Atoll City Manager, and Jackson Along, Enewetak Atoll Mayor, Majuro, January 12, 2006.
13. Helkenna Anni, Mejit Island Senator, Majuro, January 12, 2006.
14. Camilla Ingram, Majuro, January 18, 2006.
15. Dr. Masao Korean, Majuro Hospital, Majuro, January 18, 2006.
16. Dr. Sheldon Riklon, Director of Clinical Operations, Department of Energy Health Program, Majuro, January 18, 2006.
17. Betty Edmond, Majuro, January 18, 2006.
18. Rinok Riklon, Majuro, January 18, 2006.
19. Lijon Eknilang, Majuro, January 19, 2006.
20. Dora Simon, Majuro, January 19, 2006.
21. Hella Ben, Majuro, January 19, 2006.
22. Catherine Jibaiur, Majuro, January 20, 2006.
23. Kimberly Kelen, Utrik, January 22, 2006.
24. Dr. Nabin Kumar Oli, 177 Health Program Doctor, Utrik, January 23, 2006.
25. Harris Joel, Utrik Elementary School Head Teacher, Utrik, January 24, 2006.
26. Nine Brejin, Utrik, January 25, 2006.

Sections of this report were drafted by Adam Watkins, Alison Kamhi, Kim Smaczniak, and Libin Zhang, all students at Harvard Law School and members of HLS Advocates. Research assistance was provided by Yukyan Lam and Steve McGuinness, also students at Harvard Law School and members of HLS Advocates. Adam Watkins coordinated the research project and integrated the various memoranda and drafts.

The report was edited Maggie Gardner, Harvard Law School student and member of the Harvard Law Review and HLS Advocates, and by James Cavallaro, Clinical Professor of Law at Harvard Law School and Clinical Director, Human Rights Program of Harvard Law School.

Portions of the report relating to the Reagan Test Site were reviewed and approved by a missile defense expert (who wishes to remain anonymous), who formerly consulted for the U.S. Missile Defense Agency and has operational experience at the Reagan Test Site.

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APPENDIX B: LIST OF CONDITIONS AND NUMBER OF NUCLEAR CLAIMS TRIBUNAL AWARDS (AS OF DECEMBER 31, 2003)[302]

Conditions Also Recognized by U.S. Radiation Compensation Programs [303]

CONDITION	AWARDS	NCT COMPENSATION LEVEL
Leukemia	49	$125,000
Lung (bronchial) cancer	202	$37,500
Lymphomas (except Hodgkin's disease)	57	$100,000
Cancer of the thyroid	132	$50,000-75,000
Cancer of the breast	95	$75,000-$100,000
Cancer of the stomach	33	$125,000
Cancer of the pharynx	25	$100,000
Cancer of the pancreas	23	$125,000
Cancer of the colon	26	$75,000
Cancer of the ovary	56	$125,000
Cancer of the liver	36	$125,000
Cancer of the kidney	12	$75,000
Cancer of the bone	8	$125,000
Non-malignant thyroid nodule	981	$12,500-$50,000
Meningioma (benign brain tumor)	16	$100,000
Tumors of the brain	3	$125,000
Cancer of the rectum	19	$75,000
Non-melanoma skin cancer	1	$37,500
Other cancers	47	varies

Conditions Clearly Linked to Fallout from the Bravo Test or Deemed Radiogenic by the Tribunal, But Not Known to be Compensated by U.S. Programs

CONDITION	AWARDS	NCT COMPENSATION LEVEL
Unexplained hypothyroidism	17	$12,500
Severe growth retardation due to thyroid damage	2	$100,000
Radiation sickness	72	$12,500
Beta burns	72	$12,500
Benign tumor of the salivary gland	29	$12,500-$37,500
Unexplained bone marrow failure	6	$125,000
Other conditions	8	varies

Total Personal Injury Awards (through December 1, 2003)	2027 (1865 individuals)	$83.05 million

A total of 57 new and 10 amended personal injury awards were approved during 2004 for an additional $2.91 million in compensation.[304]

APPENDIX C: RADIOACTIVE EXPOSURE LIMITS AND CURRENT CONTAMINATION LEVELS

A. The Tribunal's Adoption of the 15 mrem Radiation Protection Standard is Justified

The Bush Administration's Response to the Changed Circumstances Petition asserts that exposure to 100 mrem* per year above background level is the correct regulatory dose limit for baseline radiation. However, the Nuclear Claims Tribunal's establishment of 15 mrem per year as the safe limit from which to measure damages is a more appropriate limit because it parallels current Environmental Protection Authority (EPA) standards applied in the United States, and follows the fundamental international principle requiring that radiation protection standards for releases outside national borders be no less stringent than would apply domestically.[305] Furthermore, under any potential protection standard, all experts agree that some islands are still too contaminated for human habitation.

The purpose of setting a regulatory dose limit for members of the public is to reduce the harmful effects of radiation on human health to acceptable levels. What is considered a safe dose limit has declined dramatically over time due to new findings regarding the effects of radiation, as well as increased interest in reducing general public health risks. When the Compact was enacted, the generally acceptable radiation exposure limit was 500 mrem per year.[306] In 1991, the U.S. Nuclear Regulatory Commission promulgated a radiation protection standard of 100 mrem per year from all sources of radiation for members of the general public, along with the adoption of an as-low-as-reasonably-achievable (ALARA) standard.[307] The federal government has repeatedly established regulatory dose limits lower than 100 mrem since 1990,[308] and in 1997 the EPA issued an agency guidance document setting a 15 mrem limit for cleanup of radioactive Superfund[309] sites.[310]

Under the Superfund law, EPA issued two directives applying the threshold requirement of "overall protection of human health and life" for any remediation plan for radiologically-contaminated U.S. sites.[311] These EPA directives established 15 mrem per year as the maximum upper-end dose limit.[312] This 15 mrem standard has been applied to various sites in the United States, and expert testimony before the Nuclear Claims Tribunal suggested that if the Marshall Islands were in the United States, that standard would apply to them as well.[313]

On December 21, 1998, following a hearing on the matter of cleanup criteria, the Nuclear Claims Tribunal adopted 15 mrem per year above background radiation as the cleanup criterion for the Northern Atolls.[314] Both the express language of the Section 177 Agreement principles as well as international legal principles support this finding. The Section 177 Agreement specified that the Tribunal "may have reference to the laws of the Marshall Islands…, to international law and, in the absence of domestic or international law, to the laws of the United States."[315] Here, the Tribunal first referenced international legal principles[316], determining that radiation protection standards should be at least as stringent for citizens of an exposed nation as in the country that caused the release.[317] It then applied the Third Restatement of Foreign Relations Law, under which the United States is obligated to apply "generally accepted international rules and standards for the prevention, reduction, and control of injury to the environment of another state."[318] Since the most closely analogous domestic U.S. contamination sites are held to a 15 mrem per year standard by the EPA, the Tribunal's choice of that same standard for radiation contamination caused by the United States in the Marshall Islands should be deemed reasonable.

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* One mrem is equal to 1×10^{-5} Joules of energy absorbed per kilogram of matter.

B. Current Contamination Levels Require Additional Cleanup

Radioactive contamination of a number of northern RMI islands currently exceeds the 15 mrem per year standard. While exact radiation exposure depends on a number of factors – most notably the mix of locally grown and imported foods consumed by the population – both recent radiological surveys of the RMI demonstrate that additional cleanup is necessary.[319] Even under the Administration's preferred 100 mrem standard, parts of four atolls (Bikini, Enewetak, Rongelap, and Rongerik) remain unsafe for unfettered human habitation.

Testimony in last year's Congressional hearings by authors of both reports confirm that additional cleanup is necessary. In 2005 testimony before the House of Representative Resources Committee, Dr. Steve Simon suggested that some northern atolls contain islands where it would be inappropriate for the original populations to resettle due to the high radiation level still extant.[320] Dr. John Mauro, a health physicist, also testified that the resettled populations have increased levels of exposure.[321] Table C-1 shows the results to the two recent radiological surveys in the RMI. Note that at least three islands (and as many as eleven) exceed the Administration's preferred 100 mrem standard, while at least 14 islands (and as many as 20) exceed the EPA/Nuclear Claims Tribunal standard of 15 mrem.

Table C-1: Current radiation levels on some islands, in mrem (values adjusted for 2005[*])

Source	**1994 NATIONWIDE RADIOLOGICAL STUDY[322]**				**2002 SC&A REPORT[323]**	
Diet assumption	2484 kcal/day diet 75% local food		2484 kcal/day diet 18 % local food		3208 kcal/day diet, 100% local food	
Predicted Exposure Range	Low	High	Low	High	Low	High
Bikini-Bikini	160	1600	80	400		
Northern Rongelap	120	800	40	240		
Enewetak-Enjebi	63	400	16	160		
Rongelap	40	240	12	80		
Bikini	40	240	12	80		
Rongerik	40	240	12	80		
Southern Rongelap	40	240	12	80		
Northern Enewetak	32	200	12	60		
Enewetak-Aoman	24	160	7.9	40		
Enewetak	16	120	6.3	40		
Bikini-Eneu	16	120	6.3	40		
Enewetak-Bijiri	12	90	5.6	32		
Enewetak-Lojwa	12	90	5.6	32		
Ailinginae	7	60	1.6	16		
Utrik	5	50	1.6	12		
Enewetak-Runit	5	50	1.6	12		
Ailuk	2	16	1.6	8	5	22
Mejit	1.6	12	0.6	5	5	21
Likiep	0.2	2	0.2	2	5	21
Wotje	0.2	2	0.2	2	4	18

[*] Values adjusted for the present by using the cesium-137 half-life of 30 years.

ENDNOTES

[1] H. Res. 692, 109th Cong. (2006).
[2] Embassy of the Republic of the Marsh. Is., Environment, http://rmiembassyus.org/Environment.htm (last visited Apr. 8, 2006).
[3] Cent. Intelligence Agency, World Factbook: Marshall Islands, http://www.cia.gov/cia/publications/factbook/geos/rm.html (last visited Apr. 5, 2006).
[4] Embassy of the Republic of the Marsh. Is., History of the Marshall Islands, http://www.rmiembassyus.org/History.htm (last visited Apr. 5, 2006).
[5] *See* Robert C. Kiste, *History of the People of Enewetak Atoll*, *in* I THE NATURAL HISTORY OF ENEWETAK ATOLL 17, 20 (Dennis M. Devaney et al. eds., 1987) ("The American invasion in 1944 devastated and practically denuded both the Enjebi and Enewetak Islands. Ten percent of the local population was killed.").
[6] *See id*.
[7] *See id*.
[8] *See* Compact of Free Association Amendments Act of 2003, Pub. L. No. 108-188, 17 Stat. 2720; Embassy of the Republic of the Marsh. Is., Compact, as Amended Now Implemented (May 4, 2004), http://www.rmiembassyus.org/RMI-US%20Compact.htm.
[9] U.S. Army Space and Missile Defense Command, Reagan Test Site, http://www.smdc.army.mil/RTS.html (last visited Mar. 28, 2006).
[10] *See* Micr. Support Comm., Marshall Islands: A Chronology: 1944-1981 5, http://worf.eh.doe.gov/ihp/chron/A27.PDF (last visited Apr. 5, 2006).
[11] *See* Embassy of the Republic of the Marsh. Is., Listing of Nuclear Tests in the Marshall Islands: A Chronology of Events, http://www.rmiembassyus.org/Nuclear%20Issues.htm (last visited Apr. 5, 2006) [hereinafter Listing of Nuclear Tests].
[12] *See* Ann C. Deines et al., Marshall Islands Chronology 1944 to 1990 (Jan. 11, 1990), http://worf.eh.doe.gov/ihp/chron/.
[13] *See* Kevin O'Neill, *Building the Bomb*, *in* ATOMIC AUDIT: THE COSTS AND CONSEQUENCES OF U.S. NUCLEAR WEAPONS SINCE 1940 33, 47 (Stephen I. Schwartz ed., 1998).
[14] Letter from K.D. Nichols, General Manager, Atomic Energy Commission, to W. Sterling Cole, Chairman, Joint Committee on Atomic Energy (Sept. 14, 1954), *available at* http://worf.eh.doe.gov/ihp/chron/A18.PDF.
[15] *See* Nuclear Weapons Archive, Operation Castle, http://nuclearweaponarchive.org/Usa/Tests/Castle.html (last visited Apr. 5, 2006).
[16] *See* Micr. Support Committee, s*upra* note 10, at 5.
[17] Interview with Dr. Masao Korean, Doctor at Majuro Hospital, in Majuro, Marsh. Is. (Jan. 18, 2006).
[18] *See* Micr. Support Committee, s*upra* note 10, at 8.
[19] *See* Interview with Rinok Riklon, in Majuro, Marsh. Is. (Jan. 18, 2006).
[20] *See* Interview with Lijon Eknilang, in Majuro, Marsh. Is. (Jan. 19, 2006).
[21] *See id*.
[22] Interview with Hella Ben, in Majuro, Marsh. Is. (Jan. 19, 2006).
[23] Interview by Caitlin Daly with Nine Brejin, in Utrik, Marsh. Is. (Jan. 25, 2006).
[24] *See* Deines et al., *supra* note 12.
[25] Letter from P.W. Clarkson to K.E. Fields (Mar. 6, 1954), *available at* http://worf.eh.doe.gov/ihp/chron/A11.PDF.
[26] *See id*.
[27] *See* Listing of Nuclear Tests, *supra* note 11.
[28] *See id*.
[29] *See* Nuclear Claims Tribunal, Approach to Compensation, http://www.nuclearclaimstribunal.com/appro.htm (last visited Apr. 8, 2006).
[30] *See* A. J. BRESLIN & M. E. CASSIDY, U.S. ATOMIC ENERGY COMM'N, RADIOACTIVE DEBRIS FROM OPERATION CASTLE, ISLANDS OF THE MID-PACIFIC 37 (1955) [hereinafter AEC Report].
[31] *See* David C. Holtzman, *Cancer and Three Mile Island: No Significant Increase in Five-Mile Radius*, 111 ENVTL. HEALTH PERSP. 166, 167 (2003), *available at* http://www.ehponline.org/docs/2003/111-3/EHP111pa166PDF.PDF ("The maximum dose—which refers to the worst possible exposure, in which a person would have been outdoors and directly downwind of the plant—was estimated to be 25 mrem.").
[32] *See* Listing of Nuclear Tests, *supra* note 11.

[33] *See id.*
[34] *See* Compact of Free Association Act of 1985, Pub. L. No. 99-239, 99 Stat. 1770 (1986) [hereinafter Compact I].
[35] *Id.* at § 177 (a).
[36] *See id.* at § 177(b)-(c).
[37] *Id.*
[38] *See* 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, U.S.-Marsh. Is., art. X, § 1, (Jun. 25, 1983). [hereinafter Section 177 Agreement].
[39] *See* Compact of Free Association Amendments Act of 2003, *supra* note 8.
[40] *See* Interview with Camilla Ingram, in Majuro, Marsh. Is. (Jan. 8, 2006).
[41] *See* Interview with Lijon Eknilang, *supra* note 20.
[42] Interview with Hella Ben, *supra* note 22.
[43] *Id.*
[44] *See* NAT'L ACAD. OF SCIS., BEIR VII: HEALTH RISKS FROM LOW-LEVELS OF IONIZING RADIATION REPORT IN BRIEF 3 (2005), *available at* http://www.nap.edu/reportbrief/11340/11340rb.pdf.
[45] *See* CONG. RESEARCH SERVS., REPUBLIC OF THE MARSHALL ISLANDS CHANGED CIRCUMSTANCES PETITION TO CONGRESS 14 (2005) [hereinafter CRS Changed Circumstances Report].
[46] *See* HOLLY M. BARKER, BRAVO FOR THE MARSHALLESE: REGAINING CONTROL IN A POST-NUCLEAR, POST-COLONIAL WORLD 66 (2004). Because no studies yet prove a link between uterine/cervical cancer and radiation exposure, the Nuclear Claims Tribunal does not provide compensation for the afflicted people. *See id.*
[47] *See* NAT'L CANCER INST., DIV. OF CANCER EPIDEMIOLOGY & GENETICS, ESTIMATION OF THE BASELINE NUMBER OF CANCERS AMONG MARSHALLESE AND THE NUMBER OF CANCERS ATTRIBUTABLE TO EXPOSURE TO FALLOUT FROM NUCLEAR WEAPONS TESTING CONDUCTED IN THE MARSHALL ISLANDS 18-19 (2004) [hereinafter NCI Report].
[48] *See id.*
[49] *See id.* at 16.
[50] For the time period of 1946 to 2003, the National Cancer Institute predicts that the Marshall Islands will have 240 radiation-related cancers and almost 3000 cancers overall. *See id.* at 19-20. For those estimated 240 radiation-related cancers, the Nuclear Claims Tribunal made awards to 1865 individuals. *See* NUCLEAR CLAIMS TRIBUNAL, ANNUAL REPORT TO THE NITIJELA FOR THE CALENDAR YEAR 2003 17-18 (2003) [hereinafter NCT 2003 Report].
[51] E. T. Lessard et al., *Protracted Exposure to Fallout: The Rongelap and Utirik Experience*, 46 HEALTH PHYSICS 511, 512 (1984).
[52] NCI Report, *supra* note 47, at 8.
[53] STEVEN L. SIMON & JAMES C. GRAHAM, FINDINGS OF THE NATIONWIDE RADIOLOGICAL STUDY 26-27 (1994).
[54] Marsh. Is., Changed Circumstances Petition attachment VI (Sep. 11, 2000) (on file with Harvard Law Student Advocates for Human Rights).
[55] *See* Micr. Support Committee, *supra* note 10, at 31.
[56] *See* Eugene Kroon et al., *Cancer in the Republic of the Marshall Islands*, PAC. HEALTH DIALOG, Sept. 2004, at 70, 75; *see also* Interview with Dr. Gael Laviña, in Majuro, Marsh. Is. (Jan. 12, 2006); Interview with Dr. Sheldon Riklon, Director of Clinical Operations, Department of Energy Health Program, in Majuro, Marsh. Is. (Jan. 18, 2006).
[57] *See* Kroon et al., *supra* note 56, at 71.
[58] *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[59] *See id.*; Interview with Dr. Gael Laviña, *supra* note 56.
[60] *See* Interview with Dr. Gael Laviña, *supra* note 56; Interview by Caitlin Daly with Dr. Nabin Kumar Oli, in Utrik, Marsh. Is. (Jan. 26, 2006).
[61] *See* Interview with Dr. Gael Laviña, *supra* note 56; Interview by Caitlin Daly with Dr. Nabin Kumar Oli, *supra* note 60. Four outer islands are, however, served by doctors from the 177 Health Program (Enewetak, Kili, Utrik, and Mejatto). *See* Interview with Dr. Gael Laviña, *supra* note 56.

[62] For such emergency medical evacuations, the nearest Air Marshall Islands plane is diverted to pick up the patient.
[63] *See* Kroon et al., *supra* note 56, at 71. Skin cancer is the only cancer can be treated in country. *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[64] *See* Kroon et al., *supra* note 56, at 71. There are some very limited alternatives. The 187 people in the DOE program (see § IV.B.ii, *infra*) are guaranteed referral. *See* Interview with Dr. Sheldon Riklon, *supra* note 56. If study and treatment of the patient's condition "uniquely benefit[s] Graduate Medical Education," the Tripler Army Medical Center (Tripler) may take the case and fund treatment. Donald A. Person, *The Pacific Island Health Care Project: Easing the Cancer Burden in the United States Associated Pacific Islands*, PAC. HEALTH DIALOG, Sept. 2004, at 243, 244. From 1998 to 2004, Tripler took on 192 such cancer cases from the Marshall Islands. *See id.* at 245. While this program is undoubtedly a benefit to the RMI health care system, free care at Tripler "is an exception rather than the rule." Kroon et al., *supra* note 56, at 71. In 2004, Tripler's ability to handle cases from the RMI was curtailed by overseas deployment of Army physicians, and referrals to Tripler plummeted to just two cases during the fourth quarter of FY 2004. *See* REPUBLIC OF MARSH. IS. MINISTRY OF HEALTH, FY 2004 ANNUAL REPORT 72-73 (2005), *available at* http://www.rmiembassyus.org/Health/RMI%20MOH%20Annual%20Report%20FY%202004.pdf.
[65] *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[66] *See id*.
[67] The total number of off-island referrals dropped by 49% from 1999 to 2003 (from 147 to 75), rebounding somewhat in 2004 (to 95 cases) with sharp increases in referrals to the lower cost Shriner's hospital in Honolulu and hospitals in the Philippines. *See* REPUBLIC OF MARSH. IS. MINISTRY OF HEALTH, *supra* note 64, at 73.
[68] *See* Interview with Camilla Ingram, *supra* note 40.
[69] *See* Micr. Support Committee, *supra* note 10, at 7.
[70] *See id*. at 9.
[71] *Id*. at 11.
[72] *See id*.
[73] *See id*. at 21, 23, 31.
[74] *Id*. at 9.
[75] *See* Interview with Ishmael John, Enewetak Atoll Senator, in Majuro, Marsh. Is. (Jan. 4, 2006).
[76] *See id*.
[77] *See* Deines et al., *supra* note 12.
[78] *See id*.
[79] *See id*.
[80] Interview with Lijon Eknilang, *supra* note 20.
[81] *See* DEP'T OF STATE, REPORT EVALUATING THE REQUEST OF THE GOVERNMENT OF THE REPUBLIC OF THE MARSHALL ISLANDS PRESENTED TO THE CONGRESS OF THE UNITED STATES OF AMERICA 42 (2004) [hereinafter Administration Response].
[82] *See* Appendix C, § B.
[83] *See In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 2 (Marsh. Is.).
[84] *Id*.
[85] *See* Interview with Mike Slinger, Enewetak Atoll City Manager, and Jackson Along, Enewetak Atoll Mayor, in Majuro, Marsh. Is. (Jan. 12, 2006).
[86] *See* Interview with Ishmael John, *supra* note 75.
[87] *See* Interview with Mike Slinger and Jackson Along, *supra* note 85.
[88] *Id*.
[89] *See* O'Neill, *supra* note 13, photo insert section; s*ee also* The Brookings Inst., The Cactus Dome, http://www.brookings.edu/fp/projects/nucwcost/runit.htm (last visited Apr. 18, 2006).
[90] *See* O'Neill, *supra* note 13, at 47.
[91] *Id.*; *see also* Interview with Mike Slinger and Jackson Along, *supra* note 85.
[92] *See supra*, text accompanying notes 73 and 79.
[93] *See* SIMON & GRAHAM, *supra* note 53, at 30-31. Under the more protective 15 mrem standard, Ailinginae, Utrik, and the "unaffected" atolls of Ailuk, Mejit, Likiep and Wotje may be in need of remediation as well. *See id.*; John J. Mauro et al., Investigations into the Current and Projected Radiation Exposures to the People

of Selected Atolls and Islands of the Republic of the Marshall Islands Due to Residual Radioactivity in the Environment from Nuclear Weapons Testing S-8 (2002) (on file with Harvard Law Student Advocates for Human Rights). For more information, see Appendix C.
[94] *See In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 18-24 (Marsh. Is.).
[95] *Id.* at 18-19.
[96] *See* Interview with Betty Edmond, in Majuro, Marsh. Is. (Jan. 18, 2006).
[97] Kiste, *supra* note 5, at 19.
[98] *See* BARKER, *supra* note 46,at 61.
[99] *See id.* at 61-62.
[100] Testimony of Dr. Laurence M. Carucci Before the Nuclear Claims Tribunal, *In re* People of Enewetak, No. 23-0902 (April 1999) (DVD on file with Harvard Law Student Advocates for Human Rights).
[101] *Id.*
[102] *See id.*
[103] *See* Kiste, *supra* note 5, at 22.
[104] *See id.*; *see also* Laurence M. Carucci & Mary H. Maifeld, *Ien Entaan im jerata: Times of Suffering and Ill Fortune: An Overview of Daily Life on Ujelang and Enewetak Since 1946* (Rec'd by the Nuclear Claims Tribunal on behalf of the People of Enewetak 1999) (on file with Harvard Law Student Advocates for Human Rights).
[105] *Id.*
[106] *See* Carucci & Maifeld, *supra* note 104.
[107] *Id.*
[108] *Id.*
[109] *Id.*
[110] *Id.*
[111] The Section 177 Agreement provides that the Fund "be invested with the performance goal of producing for each year of the existence of the Fund average annual proceeds of at least $18 million (Annual Proceeds) for disbursement in accordance with this Agreement." Section 177 Agreement, *supra* note 38, art. I, § 2.
[112] *See id.* at art. II, §§ 2-5.
[113] *Id.* at art. II, § 1.
[114] *See id.* at art. IV, § 1.
[115] *Id.* at art. II, § 6.
[116] Dick Thornburgh, Glenn Reichardt & Jon Stanley, The Nuclear Claims Tribunal of the Republic of the Marshall Islands: An Independent Examination and Assessment of Its Decision-making Processes 59 (Jan. 2003), *available at* http://www.bikiniatoll.com/ThornburgReport.pdf.
[117] *Id.* at 11.
[118] U.S. GEN. ACCOUNTING OFFICE, MARSHALL ISLANDS: STATUS OF THE NUCLEAR CLAIMS TRUST FUND 24 (1991), *available at* http://www.gao.gov/cgi-bin/getrpt?NSIAD-92-229.
[119] *See id.* at 25 ("Cognizant U.S. and RMI government and investment firm officials said that a 12 percent or higher return was considered achievable in the early 1980s, when negotiations for the agreement were taking place. . . . However, the funds were not provided by the United States until 1986, when the average yield on long-term bonds had declined [from 13.57] to 6.67-percent annually."). Furthermore, a huge loss of Fund value occurred in 1987, shortly after the Fund was fully invested in U.S. stocks and bonds, as the Dow Jones Industrial Average declined by almost a quarter. *See* Stock Market Crash!, Black Monday, the Stock Market Crash of 1987 (2005), http://www.stock-market-crash.net/1987.htm.
[120] NUCLEAR CLAIMS TRIBUNAL, ANNUAL REPORT TO THE NITIJELA FOR THE CALENDAR YEAR 2004 1 (2004) [hereinafter NCT 2004 Report].
[121] *See* Interview with Bill Graham, Public Advocate, Nuclear Claims Tribunal, in Majuro, Marsh. Is. (Jan. 5, 2005).
[122] NCT 2004 Report, *supra* note 120, at 8.
[123] *Id.* at 12.
[124] RESTATEMENT (SECOND) OF TORTS § 929 (1979):

Harm to Land from Past Invasions

> (1) If one is entitled to a judgment for harm to land resulting from a past invasion and not amounting to a total destruction of value, the damages include compensation for
> (a) the difference between the value of the land before the harm and after the harm, or at his election in an appropriate case, the cost of restoration that has been or may be reasonably incurred,
> (b) the loss of use of the land, and
> (c) the discomfort and annoyance to him as an occupant.

The tribunal chose the appropriate compensation under § 929(1)(a) to be the cost of restoration instead of the diminution in market value caused by the harm. The cost of restoration approach was selected because of the community's preference for restoring the damaged land; the land represents the collective labor of many generations, and the people's sense of self is deeply embedded in each particular parcel of land. The cost of restoration approach is also justified because the market value is unrealistic and uncertain since the Marshallese do not traditionally sell land rights and do not have a concrete concept of land value. *See In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 13-14 (Marsh. Is.).

[125] *See, e.g., In re* People of Enewetak at 10.

[126] *Id.* at 34.

[127] *In re* People of Bikini, Nuclear Claims Tribunal, No. 23-04134 (2001), at 45 (Marsh. Is.).

[128] *In re* People of Bikini Order, Nuclear Claims Tribunal, (Aug. 3, 2000) (Marsh. Is.).

[129] *Id.*

[130] The United States evacuated the people of Bikini in 1946, informing them that they could return in 1947. However, the United States continued to use Bikini as a test site until 1958, detonating twenty-three atomic and hydrogen bombs during the testing period. Some Bikinians returned in the early 1970s, but all were evacuated in 1978 when high amounts of radiation were found to remain. *See* Jack Niedenthal, *A History of the People of Bikini Following Nuclear Weapons Testing in the Marshall Islands: With Recollections and Views of Elders of Bikini Atoll*, 73 HEALTH PHYSICS 28, 29-33 (1997).

[131] *See In re* People of Bikini at 23; *In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 11-12 (Marsh. Is.); *In re* People of Enewetak, Order of July 27, 2000, Nuclear Claims Tribunal, No. 23-0902, at 5 (Marsh. Is.).

[132] *See In re* People of Enewetak at 28.

[133] *See In re* People of Enewetak, Order of May 5, 2000, Nuclear Claims Tribunal, No. 23-0902, at 2 (Marsh. Is.); *In re* People of Bikini at 37. The Tribunal rejected a third technique, phytoremediation, or the use of plants to strip radioactive contaminants from the soil, because "the application of the technique for cleanup of radioactive contaminants has not been demonstrated in the coral atoll environment and there is no reliable data to assess costs associated with such a clean up effort." *In re* People of Enewetak at 19.

[134] *See In re* People of Enewetak at 33; *In re* People of Bikini at 45.

[135] *See In re* People of Enewetak at 33.

[136] Mochizuki v. United States, 43 Fed. Cl. 97, 97 (Fed. Cl. 1999).

[137] *See In re* People of Enewetak at 34. The total Enewetak award was adjusted to $386 million to reflect accurately pre-judgment interest from the loss of use calculation in January 1997 to the date of the award in April 2000. *See In re* People of Enewetak, Order of May 5, 2000, at 2; *In re* People of Enewetak, Order of July 27, 2000, at 5; *see also* E-mail from Bill Graham, Public Advocate, Nuclear Claims Tribunal, to author (Apr. 19, 2006) (on file with Harvard Law Student Advocates for Human Rights).

[138] *See In re* People of Enewetak, Order of May 5, 2000, at 2; *In re* People of Enewetak, Order of July 27, 2000, at 5; *In re* People of Bikini at 45.

[139] U.S. DEP'T OF ENERGY, OFFICE OF ENVTL. MGMT., ACCELERATING CLEANUP: PATHS TO CLOSURE 2-15, 2-16 (1998).

[140] NCT 2003 Report, *supra* note 50, at 4.

[141] Interview with Bill Graham, *supra* note 121.

[142] *See* U.S. DEP'T OF ENERGY, *supra* note 139; *In re* People of Enewetak at 34; *In re* People of Bikini at 45.

[143] NCT 2004 Report, *supra* note 120, at 2-6.

[144] *Id.* at 1.

[145] *Id.* at 2.

[146] Letter from James H. Plasman, Defender of the Fund, Nuclear Claims Tribunal, to Laurie K. Beale, Stoel Rives LLP (Feb. 4, 2005) (on file with Harvard Law Student Advocates for Human Rights).

[147] *See id.* at 2.
[148] *See* Radiation Compensation Exposure Act (RECA), 42 U.S.C. § 2210 (2000). For further discussion of RECA, see § IV.A.iv, *infra*.
[149] *See* INT'L ATOMIC ENERGY AGENCY, ASSIGNING A VALUE TO TRANSBOUNDARY RADIATION EXPOSURE 9 (1985) ("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 population within the country of release"); s*ee also* RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW § 601(1)(a) (1987), "State Obligations with Respect to Environment of Other States and the Common Environment":

> (1) A state is obligated to take such measures as may be necessary, to the extent practicable under the circumstances, to ensure that activities within its jurisdiction or control
> (a) conform to generally accepted international rules and standards for the prevention, reduction, and control of injury to the environment of another state or areas beyond the limits of national jurisdiction.

[150] Nuclear Claims Tribunal, Summary of Key Decisions of the Marshall Islands Nuclear Claims Tribunal 4 (Feb. 1999) (on file with Harvard Law Student Advocates for Human Rights) [hereinafter NCT Decisions Summary].
[151] NCT 2004 Report, *supra* note 120, at 10-11.
[152] *See* NCT Decisions Summary, *supra* note 150, at 7. Studies of Japanese atomic bomb survivors' children do not show significant effects from radiation. *See* NAT'L ACAD. OF SCIS., *supra* note 44, at 4.
[153] *See* NCT Decisions Summary, *supra* note 150, at 4.
[154] *See* Nuclear Claims Tribunal, History and Activities, http://www.nuclearclaimstribunal.com/hist (last visited Apr. 6, 2006).
[155] *See* Dick Thornburgh et al., *supra* note 116, at 25-26.
[156] *See id.* at 27.
[157] *See id.* at 28. For a detailed comparison with the "downwinders," see § IV.A.iv, *infra*.
[158] *See* Interview with Bill Graham, *supra* note 121.
[159] *See* E-mail from Bill Graham, *supra* note 137.
[160] *See* NCT Decisions Summary, *supra* note 150, at 10.
[161] *See id.*
[162] *See* NCT 2004 Report, *supra* note 120, attachment 1, at 1.
[163] *See* E-mail from Bill Graham, *supra* note 137.
[164] *See* 42 U.S.C. § 2210 (2000).
[165] *Id.* at § 2210 (4)(a). While first-generation RMI claimants receive the same compensation no matter which atoll they are from, the Downwinders' program is more differentiated, allowing individuals compensation based on the length and type of exposure, as well as geographical location, *see id.*
[166] *See* Nuclear Claims Tribunal, Approach to Compensation, http://www.nuclearclaimstribunal.com/appro.htm (last visited Apr. 6, 2006); NCT 2004 Report, *supra* note 120, at 11; U.S. Dep't of Justice, Radiation Exposure Compensation System Claims to Date, http://www.usdoj.gov/civil/omp/omi/Tre_SysClaimsToDateSum.pdf (last visited Apr. 18, 2006).
[167] *See* 2004 NCT Report, *supra* note 120, Attachment 2, at 2-3.
[168] *See* E-mail from Bill Graham, *supra* note 137.
[169] U.S. Dep't of Justice, Radiation Exposure Compensation System Claims to Date, *supra* note 166.
[170] An Act to Authorize Certain Appropriations for the Territories of the United States, to Amend Certain Acts Relating Thereto, and for Other Purposes, Pub. L. No. 95-134, § 104(4), 91 Stat. 1159 (1977).
[171] An Act to Authorize Appropriations for Certain Insular Areas of the United States, and for Other Purposes, P.L. 96-205, § 102, 94 Stat. 84 (1980). Congress directed the Secretary of the Interior to "immediately begin the development of the comprehensive health care and environmental monitoring plan." S. REP. 96-467, at 9 (1979).
[172] Compact I, *supra* note 34, at § 103(j)(1).
[173] *See* Section 177 Agreement, *supra* note 38, at art. II, § 1(a).

[174] Memorandum of Understanding between the U.S. Department of Energy and the 177 Health Plan 1 (Jan. 1988), *available at* http://worf.eh.doe.gov/ihp/chron/H50.PDF.
[175] *See* Administration Response, *supra* note 81, at § 5.2.
[176] *See* Interview with Dr. Gael Laviña, *supra* note 56.
[177] *See id.*
[178] *See* Interview with Bill Graham, Public Advocate, Nuclear Claims Tribunal, in Majuro, Marsh. Is. (Dec. 30, 2005).
[179] *See* Interview with Dr. Gael Laviña, *supra* note 56.
[180] *See id.*; Interview by Caitlin Daly with Dr. Nabin Kumar Oli, *supra* note 60. The salaries paid to these doctors are extremely low, ranging from $1500 per month on Majuro to $2300 per month on Utrik. *See* Interview with Dr. Gael Laviña, *supra* note 56.
[181] *See* Interview with Dr. Gael Laviña, *supra* note 56.
[182] *See* Interview with Dora Simon, in Majuro, Marsh. Is. (Jan. 19, 2006); Interview by Caitlin Daly with Kimberly Kelen, in Utrik, Marsh. Is. (Jan. 22, 2006); Interview by Caitlin Daly with Dr. Nabin Kumar Oli, *supra* note 60; Interview by Caitlin Daly with Harris Joel, in Utrik, Marsh. Is. (Jan. 24, 2006); Interview by Caitlin Daly with Nine Brejin, *supra* note 23.
[183] *See* Interview with James Matayoshi, Mayor, Rongelap Atoll Local Government, in Majuro, Marsh. Is. (Jan. 4, 2006); Interview with Joe Saul, Mayor, Utrik Atoll Local Government, in Majuro, Marsh. Is. (Jan. 5, 2006); Interview with Eldon Note, Mayor, Bikini Atoll Local Government, in Majuro, Marsh. Is. (Jan. 6, 2006); Interview with Hiroshi Yamamura, Senator, Utrik Atoll, in Majuro, Marsh. Is. (Jan. 6, 2006); Interview with Jackson Along and Mike Slinger, *supra* note 85; Interview with Dora Simon, *supra* note 182; Interview by Caitlin Daly with Dr. Nabin Kumar Oli, *supra* note 60; Interview by Caitlin Daly with Harris Joel, *supra* note 182.
[184] *See* Interview with Lijon Eknilang, *supra* note 20.
[185] For a fuller discussion of the off-island referral crisis, see § III.A.iii, *supra*.
[186] *See* Administration Response, *supra* note 81, § 5.2.
[187] *See* Interview with Dr. Gael Laviña, *supra* note 56.
[188] *See* Compact I, *supra* note 34, § 103(j). ("Nothing in this subsection shall be construed as prejudicial to the views or policies of the Government of the Marshall Islands as to the persons affected by the consequences of the United States nuclear testing program.").
[189] *See* Robert A. Conard, Brookhaven Nat'l Lab., Fallout: The Experiences of a Medical Team in the Care of a Marshallese Population Accidentally Exposed to Fallout Radiation 15 (Sept. 1992) (on file with Harvard Law School Human Rights Advocates) [hereinafter Fallout].
[190] *See id.* at 15, 41; *see also* Interview with Lijon Eknilang, *supra* note 20.
[191] *See* Interview with Lijon Eknilang, *supra* note 20.
[192] *See* CRS Changed Circumstances Report, *supra* note 45, at 8; *see also* Interview with Dr. Sheldon Riklon, *supra* note 56.
[193] *See* Interview with Dr. Sheldon Riklon, *supra* note 56. Enrollees living in the RMI but not in Majuro, Ebeye, Utrik or Mejatto are flown into Majuro or Ebeye annually for their checkup. *See id.* Enrollees living outside the RMI are either treated at the DOE-affiliated clinic in Hawaii or are eligible to be reimbursed for the fee charged in a visit to a mainland U.S. doctor's office. *See id.*
[194] Only those physically present on Rongelap, Ailinginae, and Utrik on the day of the Bravo shot are eligible. *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[195] *See id.*; Administration Response, *supra* note 81, § 5.3.
[196] *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[197] *See* Interview with Joe Saul, Mayor, *supra* note 183; Interview with Betty Edmond, *supra* note 96.
[198] *See* Interview with Betty Edmond, *supra* note 96; Interview with Lijon Eknilang, *supra* note 20; Interview with Hella Ben, *supra* note 22.
[199] Interview with Lijon Eknilang, *supra* note 20.
[200] Interview with Dora Simon, *supra* note 182; Interview by Caitlin Daly with Kimberly Kelen, *supra* note 182; Interview by Caitlin Daly with Harris Joel, *supra* note 182.
[201] *See* Interview with Dr. Sheldon Riklon, *supra* note 56.
[202] *See* Interview by Caitlin Daly with Dr. Nabin Kumar Oli, *supra* note 60; Interview by Caitlin Daly with Harris Joel, *supra* note 182; Interview by Caitlin Daly with Nine Brejin, *supra* note 23.

[203] *See* CRS Changed Circumstances Report, *supra* note 45, at 8.
[204] *See* Interview with Bill Graham, *supra* note 121.
[205] Section 177 Agreement, *supra* note 38, preamble.
[206] Compact I, *supra* note 34, § 177(b).
[207] *See* International Covenant on Civil and Political Rights, Dec. 16, 1966, art. 2 § 3, 999 U.N.T.S 171 ("Each State Party to the present Covenant undertakes: (a) To ensure that any person whose rights or freedoms as herein recognized are violated shall have an effective remedy, notwithstanding that the violation has been committed by persons acting in an official capacity.").
[208] Section 177 Agreement, *supra* note 38, preamble. For more information about the Section 177 Agreement, see *supra* § II.B.ii.
[209] *See* Changed Circumstances Petition, *supra* note 54.
[210] *See id*.
[211] *See* Administration Response, *supra* note 81, Executive Summary.
[212] *See id.* at § 6.1.
[213] *Id.*
[214] *Id* at § 2.3.6 ("The Section 177 Agreement provided a lump-sum settlement of $150 million.").
[215] *See* Compact I, *supra* note 34, § 177(b)
[216] *Id.* at § 103(g) (emphasis added).
[217] *See infra*, text accompanying notes 220-221.
[218] *See, e.g., State ex rel. Wood v. Fisher Foods, Ltd.*, 581 N.W.2d 409, 413-14 (Neb. 1998); 82 C.J.S. *Statutes* § 307 (2005).
[219] *See* Compact I, *supra* note 34, at § 177(b) ("The Government of the United States and the Government of the Marshall Islands shall set forth in a separate agreement [i.e., the Section 177 Agreement] provisions for the *just and adequate settlement* of all such claims which have arisen in regard to the Marshall Islands and its citizens and which have not as yet been compensated or which in the future may arise…") (emphasis added).
[220] Section 177 Agreement, *supra* note 38, at art. IV ("Claims Adjudication Process"). The agreement establishes a number of rules for the basic operation of the Tribunal, including among others: the independence of the Tribunal from other legislative or executive bodies, qualifications to serve as a member of the Tribunal, and factors to consider in handing down awards. *See id.*
[221] *See* 131 CONG. REC. S15568-01 (daily ed. Nov. 14, 1985) (Senators Paul Simon (IL), Edward Kennedy (MA), Spark Matsunaga (HI), Howard Metzenbaum (OH) and John Kerry (MA) expressed "serious reservations about the constitutionality" of the agreements).
[222] *Id.*
[223] *Id.*
[224] *Id.*
[225] *Id.*
[226] John C. Babione, *Mission Accomplished? Fifty-four Years of Suffering for the People of the Marshall Islands and the Latest Round of Endless Reconciliation*, 11 IND. INT'L & COMP L. REV. 115, 140 (2000) (introducing the concept of a "prima facie case" of changed circumstances).
[227] *Id.*
[228] Section 177 Agreement, *supra* note 38, art. IX.
[229] *See* 131 CONG. REC. S15568-01 (daily ed. Nov. 14, 1985) ("there is an enormous burden on Congress to state affirmatively that if future valid claims develop we will do everything possible to compensate adequately all newly-identified victims").
[230] *See* NCI Report, *supra* note 47 at 20.
[231] Section 177 Agreement, *supra* note 38, art. IX.
[232] *See, e.g.*, RESTATEMENT (SECOND) OF TORTS § 11 cmt. a (1965) ("The circumstances which the actor should know are those which a reasonable man would know if he were in the actor's position. The qualities which primarily characterize the reasonable man, to whose standard the actor is required to conform in order to be protected in his ignorance of the actual facts, are normal acuteness of perception and soundness of judgment.").
[233] *See, e.g.*, RESTATEMENT (SECOND) OF AGENCY § 9 (1958) (comparing a "reason to know" from "should know"); RESTATEMENT (SECOND) OF TORTS § 12 (1965) (comparing the same terms).
[234] *See* RESTATEMENT (SECOND) OF TORTS § 12 cmt. a (1965).

[235] *See* Section 177 Agreement, *supra* note 38, art. IX
[236] *See supra* § V.B.i.
[237] *See supra* § III.A.i.
[238] *See* NAT'L ACAD. OF SCIS., *supra* note 44, at 4.
[239] *See supra* § III.A.ii.
[240] *See supra* text accompanying note 44-45.
[241] *See supra* IV.A.iii. For a history of changes in the pro rata payment system, see Thornburgh et al., *supra* note 116, at 34-36.
[242] *See* Interview with Bill Graham, *supra* note 121.
[243] See *supra* text accompanying note 148.
[244] CRS Changed Circumstances Report, *supra* note 45, at 10.
[245] *Id.*
[246] *Id.* at 11.
[247] For further discussion of U.S. radiation injury compensation programs, refer to § IV.A.iv, *supra*.
[248] This new class of claimants was created by an Act of the Nitijela (parliament) in 1994. Members of the Nuclear Claims Tribunal actively opposed the legislation, recognizing that such new claims would limit the funds available to the first-generation claimants. The Tribunal asked the RMI Attorney General to determine whether the law violated the Tribunal's legally mandated independence, but the Attorney General took no action. Ultimately, the Tribunal imposed a reduction of 50% on the awards to the new category of claimants. *See* 2004 NCT Report, *supra* note 120, at 3,5.
[249] *See* NAT'L ACAD. OF SCIS., *supra* note 44, at 4.
[250] *See supra* text accompanying notes 217-225.
[251] *See, e.g.*, RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW § 601(3) (1987).
[252] CRS Changed Circumstances Report, *supra* note 45, at 13.
[253] *See* NCT 2004 Report, *supra* note 120, at 6.
[254] *See* Compact I, *supra* note 34, at § 177(b); Section 177 Agreement, *supra* note 38, at art. IX.
[255] *See* CONG. RESEARCH SERVS., LOSS-OF-USE DAMAGES FROM THE U.S. NUCLEAR TESTING IN THE MARSHALL ISLANDS: TECHNICAL ANALYSIS OF THE NUCLEAR CLAIMS TRIBUNAL'S METHODOLOGY AND ALTERNATIVE ESTIMATES 6 (2005) [hereinafter CRS Loss of Use Report].
[256] Section 177 Agreement, *supra* note 38, art. VI, § 1 ("The Government of the United States reaffirms its commitment to provide funds for the resettlement of Bikini Atoll by the people of Bikini *at a time which cannot now be determined.*") (emphasis added). Given the limits of scientific understanding of radiation's effect at the time of the Compact, damages related to the future loss of use of land (damages post-1997) may constitute newly discovered damages and constitute "changed circumstances."
[257] *See supra* text accompanying notes 216-220.
[258] *See In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 6 (Marsh. Is.).
[259] CRS Changed Circumstances Report, *supra* note 45, at 22.
[260] *See* CRS Loss of Use Report, *supra* note 255, at 34.
[261] *See id.* at 15.
[262] *See In re* People of Enewetak at 8; CRS Loss of Use Report, *supra* note 255, at 17. Since literally zero transactions had occurred on Bikini or Enewetak, the appraisers were forced to look to different atolls for market values. *See* CRS Loss of Use Report, *supra* note 255, at 17.
[263] CRS Loss of Use Report, *supra* note 255, at 16-17.
[264] *See* Hallstrom Group & Raymond A. Lesher Co., Appraisal Report of the Loss in Value in Enewetak Atoll in the Republic of the Marshall Islands (1996), at 19 (on file with Harvard Law Student Advocates for Human Rights).
[265] *See* CRS Loss of Use Report, *supra* note 255, at 20-22.
[266] *See In re* People of Enewetak at 8.
[267] *See id*.
[268] *See id.* at 7.
[269] *See In re* People of Enewetak at 5; *In re* People of Bikini, Nuclear Claims Tribunal, No. 23-04134 (2001), at 8 (Marsh. Is.).
[270] *See supra* § III.C.
[271] *Cf. In re* People of Enewetak at 10-11.

[272] *See* Miller v. United States, 223 Ct. Cl. 352, 400 (1980) (relying on U.S. Treasury bond rate to set interest rate in Fifth Amendment Takings Clause case).
[273] *See* CRS Loss of Use Report, *supra* note 255, at 25.
[274] *See id.* at 32.
[275] *See id.* at 34.
[276] *See id.* at 35.
[277] *See* Frank B. Cross, *Natural Resource Damage Valuation*, 42 VAND. L. REV. 269, 314 n.240 (1989).
[278] *See* Hallstrom Group & Raymond A. Lesher Co, *supra* note 264, at 17.
[279] *See In the matter of the proceedings by the Trust Territory of the Pacific Islands, Plaintiff, for the Condemnation of the Property of Lojelan Kabua, et al., Defendants*, Civil Action No. 294, Civil Action 20-78, Memorandum Opinion, Mar. 28, 1979 (Marsh. Is.).
[280] *See id.* at 14 ("The NCT's loss-of-use methodology is based on sound economic concepts.").
[281] *See* Inst. for Int'l Law, Resolution: Responsibility and Liability under International Law for Environmental Damage art. IV (1997) ("Failure of the State to enact appropriate rules and controls in accordance with environmental regimes, even if not amounting as such to a breach of an obligation, may result in its responsibility if harm ensues as a consequence, including damage caused by operators within its jurisdiction or control.").
[282] *See* Hallstrom Group & Raymond A. Lesher Co, *supra* note 264, at 19.
[283] *See supra* text accompanying notes 44-45.
[284] *See* Compact I, *supra* note 34, at §§ 103(i), 103(k), 103(l); Section 177 Agreement, *supra* note 38, at art. VI, § 1.
[285] *See* International Covenant on Civil and Political Rights, *supra* note 207.
[286] *See* Interview with Bill Graham, *supra* note 121 (discussing the "bombshell" AEC report, *supra* note 30); Marsh. Is., Changed Circumstances Petition attachment VI (Sep. 11, 2000) (on file with Harvard Law Student Advocates for Human Rights).
[287] *See* CRS Changed Circumstances Report, *supra* note 45, at 14; Appendix C.
[288] *See* Compact I, *supra* note 34, at §§ 103(i), 103(k), 103(l); Section 177 Agreement, *supra* note 38, at art. VI, §1.
[289] *See* Appendix C, Table C-1. Depending on methodological assumptions and the applicable radiation protection standard, portions of as many as seven additional atolls (five of which are currently inhabited) could also be considered unsafe. *See id*.
[290] *See id.*
[291] *See* Appendix C.
[292] *See* Administration Response, *supra* note 81, at § 8.4.
[293] *Id.*
[294] *See id.* at § 8.3.
[295] *See id*. at Executive Summary.
[296] *See id.* at § 8.3.
[297] *See* Compact I, *supra* note 34, at §§ 103(i), 103(k), 103(l); Section 177 Agreement, *supra* note 38, at art. VI, §1.
[298] *See In re* People of Bikini, Nuclear Claims Tribunal, No. 23-04134 (2001), at 45 (Marsh. Is.); *In re* People of Enewetak, Nuclear Claims Tribunal, No. 23-0902 (2000), at 33 (Marsh. Is.).
[299] *See supra* § III.A.
[300] Compact I, *supra* note 34, at § 104(a).
[301] H. Res. 692, 109th Cong. (2006).
[302] Adapted from NCT 2003 Report, *supra* note 50, at 17-18.
[303] Radiation Exposure Compensation Act (RECA), Radiation-Exposed Veterans Compensation Act, U.S. Energy Employee Occupational Illness Compensation Act, and Veterans' Administration Regulatory List.
[304] NCT 2004 Report, *supra* note 120, at 11.
[305] *See* INT'L ATOMIC ENERGY AGENCY, *supra* note 149, at 9.
[306] *See* CRS Changed Circumstances Report, *supra* note 45, at 14.
[307] *See* 10 C.F.R. §§ 20.1101, 20.1403 (2003). The ALARA standard requires that radiation exposures to the general public be maintained as far below 100 mrem per year as is reasonably achievable. *See* 10 C.F.R. § 20.1003 (2003).

[308] *See* CRS Changed Circumstances Report, *supra* note 45, at 27-28.
[309] Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Pub. L. No. 95-510, 92 Stat. 1780 (1978), *reauthorized by* Pub. L. No. 99-499, 100 Stat. 1613 (1986).
[310] *See* CRS Changed Circumstances Report, *supra* note 45, at 27.
[311] *See* ENVTL. PROT. AGENCY, OSWER NO. 9200.4-18, ESTABLISHMENT OF CLEANUP LEVELS FOR CERCLA SITES WITH RADIOACTIVE CONTAMINATION (1997) [hereinafter Establishment of Cleanup Levels]; Envtl. Prot. Agency, Directive 9200.4-31P, *Radiation Risk Assessment at CERCLA Sites: Q&A* (1999) [hereinafter Radiation Risk Assessment]. Additional guidance is provided in ENVTL. PROT. AGENCY, OSWER 9355.3-01, GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA (1988).
[312] *See* Establishment of Cleanup Levels, *supra* note 311; Radiation Risk Assessment *supra* note 311.
[313] *See Consolidated Property Damages Cases*, Nuclear Claims Tribunal, No. 23-0902, et al. (1998), at 5 (Marsh. Is).
[314] *Id*.
[315] *See* Section 177 Agreement, *supra* note 38, at art. IV, § 3.
[316] *See* INT'L ATOMIC ENERGY AGENCY, *supra* note 149, at 9.
[317] *See Consolidated Property Damages Cases*, at 3.
[318] *See* RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW § 601(1)(a) (1987).
[319] *See* Table C-1.
[320] *See U.S. Nuclear Legacy in the Marshall Islands: Joint Hearing Before the H. Comm. on Resources, and H. Comm. on Int'l Relations*, 109th Cong. 98 (2005) (statement of Steven L. Simon).
[321] *See id*. at 86 (statement of John Mauro, Senior Vice President, S. Cohen & Associates).
[322] SIMON & GRAHAM, *supra* note 53, at 30-31.
[323] John J. Mauro et al., *supra* note 93.