

Environment, health, and other human rights concerns associated with United States nuclear weapons testing, involuntary displacement, human subject experimentation, and the failure to achieve durable solutions that protect the environment and safeguard the rights of the people of the Marshall Islands.

Submission to the United Nations Universal Periodic Review of the
United States

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Center for Political Ecology is a nonprofit research institute established in 1991. CPE works in partnership with affected communities, civil society advocates, and professional associations to conduct independent investigations into the genesis and consequential damages of environment and human rights abuse. CPE researchers have served as expert advisors to the Marshall Islands Nuclear Claims Tribunal and provided research findings in support of UNHRC Special Rapporteur investigations, including the 2012 mission to the Marshall Islands and the United States of America (A-HRC-21-48-Add1). In partnership ECOSCO-recognized organizations (International Womens Anthropology Conference, American Anthropological Association) CPE anthropologists helped facilitate international civil society involvement in the UNHRC's 2012 discussion of that report (see A/HRC/21/NGO/63 and A/HRC/21/NGO/107).

This coalition report includes first-hand information contributed Marshallese nuclear survivors. Content reflects the input of the Marshall Islands NGO Coalition: ERUB (Enewetak, Rongelap, Utrik, Bikini survivors; 'erub' also meaning damaged or broken), Iju in Ean club (meaning The Northern Star, a Rongelap Ladies club), Elimondik (an Enewetak/Enjebi supporting traditional leaders through sustainable livelihood projects and awareness of nuclear issues), WUTMI (Women United Together Marshall Islands); and an international NGO coalition: Center for Political Ecology, Cultural Survival, Japan Council Against A and H Bomb (Gensuikyo), International Womens Anthropology Conference, International Network on Displacement and Resettlement, International Physicians for the Prevention of Nuclear War, Indigenous World Association.

ERUB/Enewetak, Rongelap, Utrik, Bikini Survivors
Iju in Ean/Northern Star Rongelap Womens Club
Elimondik/Enewetak-Enjebi Sustainability Leadership Organization
WUTMI/Women United Together Marshall Islands
Center for Political Ecology
Cultural Survival
Indigenous World Association
IWAC/International Womens Anthropology Conference
INDR/International Network on Displacement and Resettlement
IPPNW/International Physicians for the Prevention of Nuclear War
Gensuikyo/Japan Council Against A and H Bomb

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SUMMARY

1. We respectfully submit to the Human Rights Council the following information regarding continuing human rights concerns in the **United States** (hereafter the US) as a result of the historical legacy of nuclear weapons tests and what the International Court of Justice ¹ recognized to be the humanitarian disaster in the Marshall Islands (hereafter the RMI) resulting from fallout, involuntary displacement, and other violations of human rights resulting from the failures to achieve durable solutions to the dislocation to indigenous ways of life.

2.. In his September 12, 2012 mission report on the Marshall Islands and the US, Mr. Calin Georgescu, United Nations Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and waste, observed that the human rights consequences of nuclear contamination involve, at the most fundamental levels, the loss of a healthy environment that sustains a viable, culturally distinct, Pacific Island way of life. Special Rapporteur Georgescu reported that the environmental health consequences of nuclear testing and remaining obligations were acknowledged in the 2008-2009 President's Cancer Panel which recommended that the US honor and make payments according to the judgments of the Marshall Islands Tribunal.² Observing that US has yet to fund Tribunal judgments beyond the initial level of \$150 million, the Special Rapporteur concluded that the Marshallese lack the means, infrastructure, and technical capacity to find durable solutions to the dislocation to their indigenous ways of life. He called for the immediate development of a national and regional plan for nuclear security and restoration of a sustainable way of life, similar to the initiatives undertaken for the benefit of affected-populations by States that historically carried out and continue to carry-out nuclear testing programmes. Issue-specific recommendations offer a framework by which truth, justice, and some measure of meaningful reparation might be achieved through actions involving the

Marshall Islands Government, the United States, the UN and its specialized agencies and institutions, and other members of the international community. These recommendations include actions that demonstrate a guarantee of non-repetition in the violations of bioethical norms and humanitarian law suggested by human subject experimentation, and in the violations of humanitarian law resulting from the development, testing and use of weapons of mass destruction.³

3. We appreciate the US promise to “continue in its decade-long engagement to address issues arising from the nuclear testing” and we strongly endorse the Special Rapporteur’s recommendations as measures that will help the RMI to achieve the right to health for the initial population, womens rights, reproductive health, and intergenerational rights; right to informed consent; right to a healthy environment; right to sustain an indigenous Pacific Island way of life; right to sustainable development; and the right to reparation and remedy.⁴

BACKGROUND

5. Residents of the UN-designated Strategic Trust Territory governed by the US, experienced from 1946-1958 unprecedented fallout and environmental contamination that compromised the health of the individuals, communities, and an entire nation. Communities living immediately downwind suffered near fatal exposures from March 1, 1954 Bravo Test fallout and residents of Rongelap, Ailinginae, and Utrik Atolls were evacuated. The US assessment of Bravo Test fallout reported, in 1955, that all 22 populated atolls in the Marshall Islands received dangerous levels of fallout. This information was kept classified, residents of other islands and atolls in the northern chain exposed to dangerous levels of fallout were not evacuated, and the knowledge of extensive nuclear contamination did not shape health policy in the Trust Territory, nor was it shared with the Marshall Islands population until long after the Compact of Free Association, with its limited medical care and compensation terms, had come into force.⁵

6. The legacy of these failures include institutionalized dependency on the US, especially with regards to (a) access to information; (b) technical assistance in defining and attending to environmental contamination; (c) inability to return to a sustainable indigenous way of life in contaminated homelands, and (d) the promise of (if not the full realization of) healthcare for cancers and other radiation-related disease including degenerative conditions, intergenerational defects, and the increased susceptibility to noncommunicable diseases as a result of population-wide exposures to toxic and radioactive fallout deposited, accumulated and absorbed into the marine and terrestrial ecosystems. Inadequate attention to the environment, and inadequate effort to develop appropriate capacity and infrastructure to treat *in situ* the predicted and emerging environmental health conditions and disease, has prompted migration that arguably constitutes involuntary displacement.

7. Survivors of acute radiation exposure and age-matched subjects from other less contaminated atolls, endured decades of imposed medical research documenting the human effects of exposure in a select portion of the exposed population while ignoring radiogenic health conditions in other island communities. This human subject experimentation program has been acknowledged by the US as a violation of human rights involving potential harm and conducted without informed consent⁶ Age-matched subjects were selected by local authorities and their forced involvement occurred without informed consent. These children underwent the same examinations as the “exposed” subjects: photographs and x-rays; measurement of internal radiation with whole-body counters; the sampling of blood, bone marrow, skin, and other tissue; and, on a number of occasions, the injection of radioisotopes, vaccines, and other nonexplained substances. As many noted in their NCT testimony in the Rongelap claim, the experience of serving as a research subject was intrusive, painful, and potentially harmful to the health of the participant. All told, some 539 men, women, and children from Rongelap, Utrik, Likiep, Enewetak and Majuro Atolls served as human subjects in studies documenting the varied late effects of radiation.⁷

8. Testimony of Lemeyo Abon: *On March 1st, 1954, I was 14 years old, living on the island of Eneaetok on Rongelap Atoll. This was the day I first experienced injustice. It was the day that deprived me of peace. The bomb by the code name 'Bravo' was exploded on Bikini Atoll just 180 km upwind from Rongelap. Unlike other nuclear weapons tested over the previous 8 years, there was no warning given to the people on Rongelap and other islands downwind of the blast. I was playing when the poisonous debris from the bomb fell on me. I didn't know what it was but because it looked like snow, I began playing with it. But suddenly it burned my eyes and mouth. Later in the evening I was so sick. All the people on the island were very sick, especially the children. The next day my skin was torn up and covered with sores. I had skin burns so badly I was in pain. My hair started to fall off. After two days of drinking contaminated water, eating contaminated food and breathing the contaminated air, we were evacuated by the U.S...*

After evacuation we became subjects of study in a top-secret research program that documented, but did not treat our injuries. The studies continued and expanded when we were returned to home islands three years later, with twice-a year visits from scientists who probed, sampled and documented the changes in our bodies in a research effort that continued for decades. In my community, we did not learn until the 1970s that our homeland was dangerously contaminated with nuclear fallout. Realizing our lives and future were being destroyed, we asked the US government to evacuate us again. They refused, and finally in 1985 we received the help of Greenpeace and we abandoned our home islands, our only possession.

This deeply disturbing history has immense and painful consequences. To this day women in the Marshall Islands give birth to jellyfish babies, or babies born with no bones in their bodies and translucent skin. Sometimes they are born alive and live for a few minutes or hours, and you can see the blood moving through their bodies before they die. We give birth to babies with missing limbs, or their organs and spinal cords on the outside of their bodies. We never experienced these types of births before the

U.S. testing program. We have complained about these births for decades and we are always told by the U.S. Government that they are not the result of radiation exposure. Yet, our language, our history, our stories have no record of these births before the testing program. After the testing program we've had to create new words to describe the creatures we give birth to.

And for those that survive, we have few resources to provide a life with dignity. Today in the Marshall Islands there is no oncologist to treat the many cancers that have become too common in our lives. Chemotherapy or radiation treatment for cancer does not exist in the Marshall Islands so we have to leave the country for treatment. Because the US denies that our radiation exposures have affected the health of children and their children, only a few people are eligible for government-funded medical treatment for their radiogenic cancers, disease, and conditions.⁸

9. Testimony of Likjon Eknilang: *"The fall-out that our bodies were exposed to caused the blisters and other sores we experienced over the weeks that followed. Many of us lost our hair, too. The fall-out was in the air we breathed, in the fresh water we drank, and in the food we ate during the days after Bravo. This caused internal exposure and sickness... In June 1957, when we did return, we saw changes on our island. Some of our food crops, such as arrowroot, completely disappeared... tapioca plants, stopped bearing fruit. What we did eat gave us blisters on our lips and in our mouths and we suffered terrible stomach problems and nausea. Some of the fish we caught caused the same problems... Our staple foods had never made us ill. We brought these problems to the attention of the doctors and officials who visited us. They said we were preparing the foods incorrectly, or that we had fish poisoning. We knew that was impossible because we had been preparing and surviving from these foods for centuries without suffering from the problems that appeared after 1954...*

... people who were not on Rongelap in 1954, but who went there with us in 1957, began to experience the same illnesses we did in later years. Foreign doctors and other officials called those people the "control group", and we were told the sickness of that group proved our illnesses were common to all Marshallese. We did not believe that, and we learned only recently that the "control group" had come from areas that had also been contaminated by radioactivity from the weapons tests.

Our illnesses got worse, and many of us died... My own health has suffered very much, as a result of radiation poisoning. I cannot have children. I have had miscarriages on seven occasions. On one of those occasions, I miscarried after four months. The child I miscarried was severely deformed; it had only one eye. I have also had thyroid surgery to remove nodules. I am taking thyroid medication which I need every day for the rest of my life. Doctors recently found more nodules in my thyroid, which have to be removed in the near future. I have lumps in my breasts, as well as kidney and stomach problems, for which I am receiving treatment. My eyesight is blurred, and everything looks foggy to me. Others in my community suffered, as well. Many children and seemingly healthy adults died unexpectedly in the years following Bravo - the reasons for which none of us fully understood at the time...⁹

10. During the trusteeship and in the years since, the US provided relatively modest

funding and technical support for humanitarian and social development needs; though a disproportionate emphasis in funding supported military infrastructure and operations, and radiation ecology and health research with an aim to inform US health programs and establish permissibility levels. When longterm effects generated cancers, subjects were taken to the US for further study and treatment. By the time territorial status was relinquished, health infrastructure in the RMI had minimal capacity to address individual radiogenic disease, nor the systemic infrastructure to attend to ever-escalating set of problems.

11. The 177 Healthcare Program established under the Compact of Free Association to provide healthcare services to members of four atoll communities officially recognized in 1954 by the US as exposed. With annual funding provided by the US, this system services only the basic needs of these four communities, it does not have the ability to diagnose many conditions, nor does it have the means to provide late-stage cancer treatments. As a result people are often diagnosed with radiogenic disease in Hawaii, Guam, or other locations, when their illness is so advanced that treatment becomes impossible. Healthcare treatment for other radiation-related disease and degenerative conditions is similarly problematic; eye surgeries, amputations, kidney dialysis and other critical services are usually rendered abroad.

12. Testimony of Mores Abraham: *My mother Rose David was born and raised on Ujelang Atoll during the time of the nuclear tests on our home atoll, Enewetak. Mama and the rest of my family experienced great suffering while on Ujelang. Some people starved to death there including my great-grandfather. My father contracted rheumatic fever as a child in Ujelang and died in 2009 in Hawai'i as a result of rheumatic heart disease. Papa and Mama had gone to Hawai'i at that time to seek medical treatment. But anyway, my family moved back to Enewetak in 1980 and I was one of the first children born there after the resettlement. We had a lot of suffering growing up in Enewetak. I remember when I was in fourth grade we had a time of starvation (neta). We didn't go to school because we didn't have any food. At that time in Enewetak, we didn't even have local food to eat. We experienced neta again when I was a teenager but at least we had pandanus to eat, but that was all. I have six sisters (more but they died before I was born and one brother that died when I was young) and Mama took care of us all through all the hardships. In 2012 Mama developed a sore on her head. The doctor in Enewetak gave her antibiotics. The doctor gave her antibiotics for nearly four months. She came to Majuro on her own and went to the 177 clinic where the doctor gave her more antibiotics. We sent her to Hawai'i to see the doctors there. She applied for Quest [state medical care] and they ended up treating her cancer. She had a big sarcoma on her head that got bigger and bigger. She went through chemotherapy but the cancer was too advanced by that time. In July 2013 we brought her back to Majuro to live with us and she died October 11, 2013. She really suffered through her treatments and was in so much pain at the end. I want to know why Mama is gone now. I want to know why she suffered for her whole life.¹⁰*

12. The RMI Islands Nuclear Claims Tribunal recognizes some 36 forms of radiogenic cancers and disease as resulting from nuclear weapons test exposures. A

review of Tribunal awards in 2007 found that most awards were for thyroid cancers and disease, pulmonary and lung cancer, cancers of the blood, bone marrow, and lymph nodes, breast cancer, and cancers of the ovary.¹¹ Chronic and acute radiogenic exposure creates documented impact on cardiovascular system function,¹² impacts immune system response, and creates a population-wide vulnerability to infectious and non-communicable disease. For example, worldwide some 1/3 of the human population carries the bacterium for tuberculosis; but most people do not become sick as their immune systems fight off infection.¹³ In 2005, the Marshall Islands the tuberculosis rate was some 23 times the rate of the US.¹⁴ In 2011, Marshallese mortality rates for TB were the highest rate in the Pacific, and fourth highest in the world.¹⁵ Other infectious disease runs rampant.¹⁶

13. Non-communicable disease and degenerative health conditions, especially conditions associated with radiation-exposure and life in a heavily contaminated environment, are crippling an over-taxed and under-developed health infrastructure. Comparing the relative health of US residents with that of its' former territorial citizens, the Marshallese, is insightful. In the US, the diabetes prevalence rate is 9.35%. In the Marshall Islands the rate is 27.06%, third highest rate in the world, and diabetes is the number one cause of death.¹⁷ Infant mortality in the US is about 6 deaths per thousand; in the Marshall Islands the 2012 rate is about 23 per thousand, a rate comparable to Kazakhstan, another nation victim to nuclear testing.¹⁸ On average, Americans live for some 77.5 years; in the Marshall Islands the end of life comes considerably sooner, 15 years sooner, as overall longevity is 62 years.¹⁹

14. Indigenous rights to a Pacific Island sustainable way of life have been hugely impacted as a result of environmental contamination, displacement, and related difficulties to reclaim a determinant role as environmental stewards. For example, the majority of nuclear tests in Enewetak were detonated in the northern part of the atoll, home of the Enjebi people, and have been declared off-limits due to contamination for at least 24, 000 years. Some highly contaminated debris has been concentrated and capped with cement, Runit Dome (which is designated offlimits, yet there is no monitoring, fencing or patrolling to ensure people are kept out. In 2012 the RMI learned that the island itself has never been properly assessed, and while high resolution sampling over an 18-month period would provide accurate and helpful stewardship information, there are no resources to conduct such a study for Enewetak, let alone to identify hotspots that likely exist across the nation.²⁰

STRUGGLE TO SECURE RIGHT TO REPARATION AND REMEDY

15. In 1988, in exchange for dropping \$5 billion in claims pending in the US Courts and limited independence for the US territory, the United States established a Nuclear Claims Tribunal as a reparation mechanism to receive and adjudicate personal injury and property damage claims. The NCT functioned with a limited pool of \$150 million and the right to return to Congress to expand that pool should conditions change or new information come to light. To develop and hear claims, the

NCT brought new independent experts in to evaluate the extent of damage and develop remedial recommendations. Property damage awards to and cost to restore four atolls total some \$4 billion. After a decade of investigation and claims hearings, over 2,000 Marshallese were found to be eligible for medical compensation from some 75 different forms of cancer and other radiogenic disease, and following the Rongelap claim, some were awarded compensation for their experiences in human radiation experiments.

16. Due to the immense gap between recognized damages and the initial funding for the NCT no person nor party received full payment on their award. In 2001, and in subsequent petitions, the RMI requested US Congress to fully fund the NCT. Arguing that circumstances have changed as declassification and scientific advances prompted new understanding of the nature and extent of environment contamination and related damages to health, RMI and civil society representatives testified to Congress. Following a 2005 Executive Branch report arguing that all obligations have been met, no Congressional action has been taken. Appeals filed in the US Court system have been denied a hearing, as the Compact of Free Association denies the RMI standing in US Courts on nuclear compensation claims. Given this impasse, the RMI is severely challenged to meet societal obligations to uphold fundamental rights to life, health, a healthy environment, and a culturally viable way of life.

17. Reparation should restore a culturally-vibrant, healthy, sustainable way of life for the Marshallese people. Today, the majority of nuclear survivors from Bikini and Rongelap live in exile, largely on borrowed or rented Marshallese land on Kwajalein, Majuro, Kili, in Hawaii and the continental US. Many islands in the northern atolls have been declared off-limits for the next 24,000 years. Bilateral agreements between the US and the RMI have resulted in modest levels of assistance in attending to some of the nation's radiogenic environment and health issues in the Rongelap, Utrik, Enewetak and Bikini Atoll communities.²¹ Attempts to remediate radiation hotspots on areas of some islands and to rebuild homes on the island of Rongelap, for example, suggest that that someday soon refugees from Rongelap may have the choice of returning home: as of this writing an island-specific remediation and village construction program is largely completed and 60-70 people (construction workers and their families) live on Rongelap island.²² However, given the degree of contamination and remediation limitations, return to a traditional self-sufficient way of life in heavily contaminated atolls like Rongelap is impossible. Remediation has occurred under the guidance and with scientific assistance from the US Department of Energy whose definition of "safe" levels of exposure assumes that people will avoid known hotspots on Rongelap island, will restrict their dietary consumption of local foods to below 30%, the nation's inter-island transportation system will be able to regularly deliver imported foods, residents will be able to garner the income to pay for food imports, and residents will avoid visiting or collecting food and water from many of the 60 other islands in Rongelap atoll.

18. Despite decades of remedial attention from the US, the fundamental conditions of life in the RMI remain tenuous, conditions made clear through NCT deliberations and judgments, most recently reconfirmed by the Special Rapporteur's 2012 report. NCT award determinations are meant to fund proactive strategies to reduce risk, grow healthy and safe food, enhance individual, family and community health, repair and compensate internally displaced communities of Bikini, Enewetak, Utrik and Rongelap, and other measures that seek to rebuild a sustainable and healthy way of life. The administrative court process represented a defacto truth commission for the RMI. The promise of meaningful reparation outlined in NCT awards has, to date, been illusive.

RECOMMENDATIONS

19. In response to the Special rapporteur's mission to the RMI and US, Lemeyo Abon expresses sentiments shared by many Marshallese people:

"We believe, like other indigenous nations, that it is our sacred duty to sustain the land and to take care of future generations so they can thrive, and given the many challenges of attending to health and welfare in a nation compromised by its service as a nuclear weapons proving ground, we welcome the assistance of the United States and the international community, especially if that assistance helps us to achieve adequate healthcare and a safe and secure environment.

We gave the world knowledge of the many ways that radiation can destroy a human being, yet today we see our cultural ways of life sorely affected by the loss of our beloved homes, and our people plagued by illness caused by radiation. Our experience is that nuclear fallout creates damages that endure and expand. Yet, U.S. assistance programs continue to contract and deny.

An island may be remediated, with radioactive soil, plants, and debris removed, but is it safe? In our culture we rely on the wealth of many islands to get access to the food, medicine, housing, water and other resources. A single coral island in the Marshall Islands cannot support a community, and a partial cleanup of one island is not the same as restoring our homelands.

The nuclear survivors of ERUB and the Marshall Islands applaud the investigation of the Special Rapporteur into the human rights violations connected to the U.S. testing of nuclear weapons in the Marshall Islands and we welcome his recommendations that the United States should fully fund the awards made through the RMI Nuclear Claims Tribunal, expand medical assistance programs, assist in building a national healthcare system that can attend to the legacies of nuclear testing, and help us to assess and restore our severely contaminated environment"(cite).

SPECIFIC RECOMMENDATIONS

20. We respectfully request that the UPR Working Group and the Human Rights Council urge the Government of US to:

- a. Fully embrace and implement the Special Rapporteur's 2012 recommendations.
- b. Support an independent review of history, performance, and needs of the 177 Health Program.
- c. Support bilateral mutual engagement and international partnerships to build, staff, and sustain a comprehensive health treatment system in the Marshall Islands that attends to the acute, chronic, and inter-generational effects of exposure to radiogenic and other toxic contaminants resulting from the US military use of that nation. Until such time as local health needs can be fully addressed within the nation, establish or strengthen bilateral agreements to insure reliable and timely access to high standard cancer care that is seamlessly integrated with a system of with quality local primary and continuing care and follow-up; and support RMI efforts to expand the capacity of all outer island medical staff to recognize and attend to radiogenic and related degenerative illness.
- d. Marshallese have experienced population-wide exposures that have and will continue effect health for generations to come. They need healthcare wherever they reside. For those who have left the RMI and reside in the US this is very important. The US should expand its efforts to educate and assist the extra-burden that states incur in caring for the radiation-related health issues that plague diaspora communities.
- e. Support and provide technical assistance to the RMI in conducting a high-resolution sampling of Cactus Dome on Runit Island, Enewetak Atoll, as part of a nation-wide assessment that takes advantage of current and emerging nuclear disaster assessment, sampling and remediation technologies.
- f. Expand US federal program assistance to the RMI in ways to include livelihood projects that strengthen customs and culture of communities displaced from traditional homelands, including the four atoll communities.
- g. Drawing upon the lessons learned from similar endeavors through the US National Park Service, support and assist in efforts to fund and run an international nuclear heritage museum in the RMI.
- h. Recognize that, with climate change, the Runit Dome creates new human environmental rights issues. When -- and not "if" -- that structure succumbs to sea-level rise it threatens communities beyond just the resettled Enewetak community. Include these concerns in the larger effort to understand and attend to the threats resulting from climate change.

¹ International Court of Justice, The Hague, 14 November 1995, President Bedjaoui presiding in the case in Legality of the Use by a State of Nuclear Weapons in Armed Conflict (Request for Advisory Opinion Submitted by the World Health Organization) and in Legality of the Threat or Use of Nuclear Weapons (Request for Advisory Opinion Submitted by the General Assembly of the United Nations).

² *Reducing Environmental Cancer Risk - What We Can Do Now, President's Cancer Panel 2008/2009 Annual Report*. April 2010. US Department of Health & Human Services, National Institute of Health, National Cancer Institute. Accessed 1 August 2014, http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf

³ United Nations Human Rights Commission, A/HRC/21/48/Add.1).

⁴ Op cit, note 5. Us reply to SR recommendations reported by UN Media Office at Geneva, accessed 1 August 2014, [http://www.unog.ch/unog/website/news_media.nsf/\(httpNewsByYear_en\)/C8C309566D25DA72C1257A780040B0D9?OpenDocument](http://www.unog.ch/unog/website/news_media.nsf/(httpNewsByYear_en)/C8C309566D25DA72C1257A780040B0D9?OpenDocument)

⁵ A. Breslin and M.E.Cassidy, 1955, Radioactive Debris from Operation Castle, Islands of the Mid-Pacific, United States Atomic Energy Commission, New York: New York Operations Office. Declassified by the U.S. in 1994 and delivered to the Republic of the Marshall Islands (RMI) in 1995, this document reports significant levels of radiation from fallout measured in 1954 at sites on twenty-eight atolls, of which twenty-two were populated during Operation Castle (March 1 through May 14, 1954). Thus, regardless of location in the Marshall Islands during Bravo Test, all residents were exposed to radioactive fallout as result of the atmospheric weapons tests, a finding reconfirmed by H. Behling, J. Mauro, and K. Behling, 2002, Final Report: Radiation Exposures Associated with the U.S. Nuclear Testing Program for Twenty-one Atolls/Islands in the Republic of the Marshall Islands, S. Cohen and Associates, McLean, VA.

⁶ Advisory Committee on Human Radiation Experimentation, 1995, *The Human Radiation Experiments: Final Report of the President's Advisory Committee* (Washington, DC: US Government Printing Office). See also Marshall Islands Nuclear Claims Tribunal "April 17, 2007 judgment in the Rongelap claim." http://www.moruroa.org/medias/pdf/RONGELAP_DECISION%202007.pdf

⁷ Detail on human radiation experimentation derived from review of declassified records accessed by ACHRE in 1994, and subsequently declassified records received by the Marshall Islands Nuclear Claims Tribunal and used in support of their April 17, 2007 judgment in the Rongelap claim. For expert witness testimony and contextualized discussion, see Johnston, Barbara Rose, and Holly M. Barker, 2008, *The Consequential Damages of Nuclear War: The Rongelap Report* (Walnut Creek, CA: Left Coast Press).

⁸ Interactive Dialogue statement on [A/HRC/21/48/Add.1](http://www.unhcr.org/refugees/refugees/2012/09/12sept2012.html), UNHRC Session 21, 15 September 2012. Statement reprinted in full 12 September 2012, accessed 1 August 2014 <http://www.truth-out.org/speakout/item/11695-marshall-islanders-stand-before-un-council>

⁹ Op cit, note 1, pages 25-28, accessed August 1, 2014 <http://www.icj-cij.org/docket/files/93/5968.pdf>

¹⁰ Statement by Mores Abraham, recorded on September 14, 2014 by Brooke Takala Abraham (Elimondik, an Enewetak-based NGO). In this testimony Mr. Abraham discusses his mother's condition and frustration that, although she was eligible for care under the 177 program, she did not receive adequate care in the Marshall Islands as the local doctors did not recognize early stages of cancer and would not have been able to treat her condition locally.

¹¹ Op cit, note 10, Johnston and Barker 2008:242. Due to failure of the United States to fully fund the Tribunal, no personal injury claim has been paid in full.

¹² Brookhaven Lab medical surveys document changes in red blood cell production, bone marrow function, and chronic disease in radiation-exposed populations (Conard et al. reports, op cit 5). Research conducted by the Atomic Bomb Casualty Commission (and, later, the Radiation Effects Research Foundation) demonstrated immune cell response to radiation and the finding that “persons with higher radiation exposures have lower numbers of CD4 T cells and elevated levels of various inflammatory proteins in their blood” and “a slight dose-related decrease in immunity has been observed against certain viral infections.

http://www.rerf.jp/radefx/late_e/immunity.html . A review by Little et al 2012 confirms association between circulatory disease mortality and low and moderate doses of ionizing radiation with findings that suggest findings suggest that overall radiation-related mortality is about twice that currently estimated based on estimates for cancer end points alone. See: Environmental Health Perspectives 120:1503–1511 (2012), <http://dx.doi.org/10.1289/ehp.1204982> [

¹³ World Health Organization, Fact Sheet No. 104, Revised March 2006; The Global Fund, World TB Day 2005; WHO TB Fact Sheet, World TB Day 2007.

¹⁴ Center for Disease Control, 2006, Trends in Tuberculosis - United States, 2005; USAPI 2005, Tuberculosis in the US-affiliated Pacific Island Jurisdictions; Giff Johnson, 2006, Marshalls Top Northern Pacific in Tuberculosis, Pacific Islands Report, May 15, 2006.

¹⁵ Tuberculosis death rates per 100,000 in 2011: Global rate of 14; Marshall Islands rate of 74; US rate of 0. Source: World Health Organization, Global Tuberculosis Report 2012.

¹⁶ Beatty, et al. 2004, An Outbreak of *Vibrio cholerae* O1 Infections on Ebeye Island, Clinical Infectious Diseases, 38:1-9; Hyde et al. 2003, Measles Outbreak in the Republic of the Marshall Islands, International Journal of Epidemiology, 35(2):299.

¹⁷ Comparative prevalence rate (% of the World Health Organization standard). Sources for these comparative figures: International Diabetes Federation, 2012; American Diabetes Association, 2007; Perez Williams and Hampton, 2005; Yamada et al., 2004; and US Embassy, Majuro, Marshall Islands, 2007.

¹⁸ World Health Organization Global Health Observatory Data Repository, MDG 4: Child Health: Infant mortality. Data by Country. <http://apps.who.int/gho/data/node.main.526>

¹⁹ United National Development Program, 2006; World Health Organization, 2006.

²⁰ Reported by Ambassador Thomas Kijiner, 17 December 2012, IAEA Fukushima Ministerial Conference.

²¹ Despite the 1990s release of declassified documents from 1954 demonstrating nation-wide exposure to dangerous levels of fallout, the US still argues that their obligation to provide medical assistance and repair the environment is limited to the four northern atolls.

²² Workers associated with the Marshall Islands US Department of Energy Assessment & Radioecology Program, US Department of Energy.