Fact Sheet

Defense Threat Reduction Agency
U.S. Strategic Command Center for Combating Weapons of Mass Destruction
Standing Joint Force Headquarters for Elimination

Hiroshima and Nagasaki Occupation Forces

Note: *For information related to benefit claims, call the Department of Veterans Affairs (VA) at 800-827-1000. For information related to participation or dose reconstruction, call the Nuclear Test Personnel Review (NTPR) Program at 800-462-3683.*

Overview

Atomic bombs were detonated over Hiroshima and Nagasaki, Japan, on August 6 and August 9, 1945, respectively. Following the surrender of Japan on August 14, 1945, U.S. forces began occupying the country. The first occupation troops arrived in the vicinity of Hiroshima about 60 days after the bombing. The main body of occupation troops entered Nagasaki about 45 days after the bombing. In each city, a group of American scientists from the Manhattan Engineer District arrived 3 days before these troops and performed a radiological survey. However, repatriation of former prisoners of war (POWs) through Nagasaki began before the survey and actual occupation of the city.

U.S. troops were in the vicinity of Hiroshima between October 6, 1945, and March 6, 1946, and in the vicinity of Nagasaki between September 11, 1945, and July 1, 1946.[1]

The mission of the occupation was to establish control of the area, ensure compliance with surrender terms, and demilitarize the Japanese war machine. The mission did not include the cleanup or any radiological decontamination of Hiroshima, Nagasaki, any other areas, or the rebuilding of Japan.

Units Involved

- Hiroshima - 186th Infantry Regiment of the 41st Division, X Corps of the Sixth Army; later replaced by the 34th Infantry Regiment of the 24th Division.

- Nagasaki - 2nd Marine Division, which included the 2nd, 6th, and 8th Regimental Combat Teams (RCTs) and an Artillery Group composed principally of the 10th Marine Regiment. Other units of the 2nd Marine Division involved were a Headquarters Battalion, Service Troops, an Engineer Group, a Tank Battalion, an Observation Squadron, and some smaller organizations.

Troops were constantly on the move and changing assignments during the occupation, and the duration of assignment for any unit in the occupation forces was quite short. Men with the longest service periods were given priority for transfer home and whole units were deactivated as it became apparent that large numbers of troops were not necessary to fulfill the mission. The size of the occupation force dropped sharply every month.

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[1] *Some occupation troops remained in the vicinity of Nagasaki later into 1946. However, VA regulations define the occupation of Japan as ending on July 1, 1946.*

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The total number of troops occupying Hiroshima was formerly estimated to be about 40,000, and approximately 27,000 troops occupied Nagasaki. About 12,000 troops occupied outlying areas within 10 miles of either city through July 1, 1946. An additional 118,000 servicemen or more had passed through these areas by July 1, 1946. These transient personnel included POWs, troops disembarked for elsewhere in Japan, and crews of ships docked nearby. To date, the Nuclear Test Personnel Review Program has identified over 255,000 veterans who participated in the occupation of Hiroshima and/or Nagasaki.

Refer to Title 38, Code of Federal Regulations, Part 3.309(d)(3) for the complete context of the following excerpted formal VA definitions of occupation forces and POWs:

> *Occupation force: The occupation of Hiroshima or Nagasaki, Japan, by United States forces during the period beginning on August 6, 1945, and ending on July 1, 1946.*
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> *POW: Internment as a prisoner of war in Japan (or service on active duty in Japan immediately following such internment) during World War II, which resulted in an opportunity for exposure to ionizing radiation comparable to that of the United States occupation forces in Hiroshima or Nagasaki, Japan, during the period beginning on August 6, 1945, and ending on July 1, 1946.*
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> *The term "occupation of Hiroshima or Nagasaki, Japan, by United States forces" means official military duties within 10 miles of the city limits of either Hiroshima or Nagasaki, Japan, which were required to perform or support military occupation functions such as occupation of territory, control of the population, stabilization of the government, demilitarization of the Japanese military, rehabilitation of the infrastructure, or deactivation and conversion of war plants or materials.*
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> *Former prisoners-of-war who had an opportunity for exposure to ionizing radiation comparable to that of veterans who participated in the occupation of Hiroshima or Nagasaki, Japan, by United States forces shall include those who, at any time during the period August 6, 1945, through July 1, 1946:*
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> *(A) Were interned within 75 miles of the city limits of Hiroshima or within 150 miles of the city limits of Nagasaki, or*
> *(B) Can affirmatively show they worked within the areas set forth in (A) although not interned within those areas, or*
> *(C) Served immediately following internment in a capacity which satisfies the above definition of occupation forces, or*
> *(D) Were repatriated through the port of Nagasaki.*

Occupation scenarios

Hiroshima. Elements of the 41st Division landed at Hiro, approximately 10 miles southeast of Hiroshima, on October 6, 1945, and secured the Kure Naval Yard. On October 7, the 186th Infantry Regiment of the 41st Division landed, and the Regiment's 2nd Battalion established headquarters and billets in Kaidaichi, about 5 miles southeast of the center of Hiroshima. Since most of the city of Hiroshima had been destroyed by the bomb (see Figure 1), no major units were stationed there throughout the occupation. During the next 2 months, units of the 186th Infantry Regiment conducted reconnaissance patrols and other missions in its area of responsibility, including the city of Hiroshima. Records indicate that troops occasionally patrolled the destroyed area of the city. Additionally, individuals from nearby units of the 41st could have made brief sightseeing trips to view the destruction caused by the bomb. About 900 American POWs were repatriated through Hiroshima.

Upon deactivation of the 41st Division in December 1945, the 34th Infantry Regiment of the 24th Division took over its mission and moved into the buildings in Kaidaichi originally used by units of the 186th. The 34th Regiment was responsible for such a wide geographic area that eventually only Company G of the

2nd Battalion was stationed in the vicinity of Hiroshima. On March 6, 1946, the 34th Regiment was relieved by an Australian Infantry Battalion, and the U.S. occupation in the vicinity of Hiroshima ended.

Nagasaki. Nagasaki was used to repatriate former POWs because the waterfront was sufficiently far from the hypocenter (the spot on the ground directly under the detonation, i.e., ground zero) to have escaped most of the destructive effects of the bomb and to have been free of radioactivity (see Figure 2). Over 9,000 allied POWs (including 2,300 Americans) were processed at Nagasaki from September 11 to 23, 1945. A POW recovery team and a detachment of Marine guards were ashore in Nagasaki to support POW processing. Additionally, a small advance party of the occupation force (about 12 personnel) arrived in Nagasaki on September 16, 1945, and remained until the main force arrived on September 23, 1945.

Upon landing, the 8th RCT and the 10th Marines deployed immediately to Isahaya, about 10 miles north of Nagasaki. The 8th RCT did not occupy Nagasaki, but the 10th Marines did so 2 months later. The other elements of the 2nd Marine Division debarked in the vicinity of Dejima Wharf and the Mitsubishi shipyard and established command posts and billets in those vicinities. The 2nd RCT left Nagasaki in early November, and the 6th RCT departed in December 1945 along with two-thirds of the Engineer Group. The Headquarters Battalion and portions of the Service Troops left Nagasaki in January 1946. The Tank Battalion, which had landed and remained in Fukahori, about 9 miles southeast of Nagasaki, arrived in November 1945 and departed the next month. The 10th Marines took over the responsibilities of the 2nd RCT in November, and later also those of the 6th RCT. The last units of the 2nd Marine Division left Nagasaki on July 1, 1946.

The specific billet locations of all units have not been precisely determined, but they were undoubtedly outside of the radiation survey contours surrounding the hypocenter in Figure 2. An area extending beyond those contours was uninhabitable because of complete destruction, and historical documents confirm that the area was avoided. As with Hiroshima, presumably patrols and sightseers occasionally entered the areas of residual contamination in Nagasaki.

The U.S. Navy transported Marines to Nagasaki and evacuated POWs, but its role ashore was limited. Some Navy personnel, including hospital corpsmen, medical and dental officers, chaplains, and a construction battalion, were assigned to the 2nd Marine Division.

Radiation Data

Analysis of the scientific data for the Hiroshima and Nagasaki airbursts continues, resulting in revised statistics for the detonations.[2] The Hiroshima bomb was a uranium-235 weapon that detonated approximately 1,970 feet above the ground with a yield of 16 kilotons (kt). The Nagasaki bomb was a plutonium-239 weapon that detonated at 1,650 feet with a yield of 21 kt. Surveys by the Naval Medical Research Institute (Figures 1 and 2) show the built-up areas of the respective cities, the hypocenter of each burst, residual gamma radiation intensity contours, and the approximate perimeters of total destruction from blast and fire.

[2] *In 2003, the Radiation Effects Research Foundation (RERF) approved a reassessment of the dosimetry system (DS02) used to determine prompt radiation doses for atomic-bomb survivors. This study resulted in a slight change of the estimated yield and epicenter of the Hiroshima detonation. However, the new information does not affect doses for occupation troops, which are based on actual measurements of radiation intensity.*

The radiological effects of the detonation in each city were similar. Japanese citizens in the vicinity at the time of the detonations were exposed to intense radiation produced almost instantaneously. High doses of hundreds of rem[3] from this initial neutron and gamma radiation contributed to the lethal effect on Japanese citizens located beneath the bursts. This initial radiation only occurs for about one minute after a nuclear detonation and does not persist thereafter.

In contrast, the earliest residual radiation levels encountered by Japanese were survivable. Both burst altitudes were sufficiently high that bomb debris did not reach the ground in the vicinity of the hypocenter. After the detonations, strong thermal updrafts were produced which lifted the radioactive bomb debris and smoke into “mushroom” clouds. Most of the mixed debris settled to the ground as radioactive fallout downwind of the cities. In each city, there was one area of low-level residual radioactivity in a roughly circular area caused by neutron activation of soil and building materials around the hypocenter. Additionally, there was a second area of residual radioactivity located downwind and outside the city, caused by fallout carried to the ground during rain shower activity within an hour after the detonation. Subsequent heavy rainfall washed away some of the residual radioactivity. During the intervening weeks before the occupation forces arrived, this rainfall, combined with radiological decay, reduced the radiation levels from fallout and neutron-activated materials by a factor of several thousand. This explains, in part, why the radiation doses of occupation forces were at least a thousand times lower than those of Japanese citizens located near ground zero at the time of the detonation.

Based on radiation surveys performed by American scientists from the Manhattan Engineer District prior to the arrival of the occupation forces, the greatly-decayed residual radioactivity levels in and around Hiroshima and Nagasaki at the time the occupation forces arrived were such that military activities could proceed as planned, unimpeded by radiological considerations.

The Nishiyama Reservoir had the highest radiation measurement recorded at the time of the troops’ arrival. However, this area was remote and rugged, with steep slopes and heavy forests, few trails or roads, and even fewer buildings. The Japanese population in the area was sparse, so there were no occupation forces stationed in the vicinity, and little need for military patrols into the area.

Personnel doses

Dose reconstructions are based on (1) residual radiation measurements, documented and published shortly after the bombings, (2) extensive review and analysis of the residual radioactivity in ensuing decades, (3) veteran activities, (4) the documented arrival and departure dates of each military unit which operated in the vicinity of Hiroshima and Nagasaki, (5) and potential fallout contact exposure.

Doses received by veterans at Nagasaki were generally low; the approximate maximum external dose based on a presence for entire interval from September 16, 1945, to July 1, 1946, is 1.25 rem. Potential exposure to occupation troops assigned to Hiroshima was markedly lower due to radioactive decay prior to the delayed October 6, 1945, entry into the city. External doses received by Kumamoto POWs for the interval from detonation on August 9, 1945, to a repatriation date of approximately September 23, 1945, is < 1 rem. Skin dose estimates for these POWs assume lack of sheltering and continuous contact with fallout contaminated surfaces since the POWs slept on the ground.

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[3] *A rem is a radiation protection unit of measure that quantifies the risk of biological effects resulting from exposure to ionizing radiation. Ionizing radiation is any radiation (gamma, x-ray, beta, neutron, or alpha) capable of displacing electrons from atoms or molecules, thereby producing ions. According to the National Council on Radiation Protection and Measurements (NCRP, Report No. 160, Table 1.1), the general U.S. population receives about 0.62 rem per year from natural background radiation sources (radon, cosmic rays, and rocks) and man-made radiation sources (medical diagnostic x-rays and consumer products).*

Doses to Japanese Survivors

The doses noted in the previous paragraph are orders of magnitude lower than the reconstructed initial radiation doses for the hundreds of thousands of Japanese survivors, which ranged up to hundreds of rem. Their health continues to be monitored by the Radiation Effects Research Foundation (http://www.rerf.or.jp/). For further information on RERF or the studies of Japanese atomic bomb survivors, contact:

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National Academy of Sciences
500 Fifth Street, NW
Washington, D.C. 20001
(202) 334-3600
http://dels.nas.edu/nrsb

For more information, see the report "Radiation Dose Reconstruction, U.S. Occupation Forces in Hiroshima and Nagasaki, Japan, 1945-1946" (DNA 5512F), available online at: http://www.dtra.mil/Home/NuclearTestPersonnelReview.aspx.

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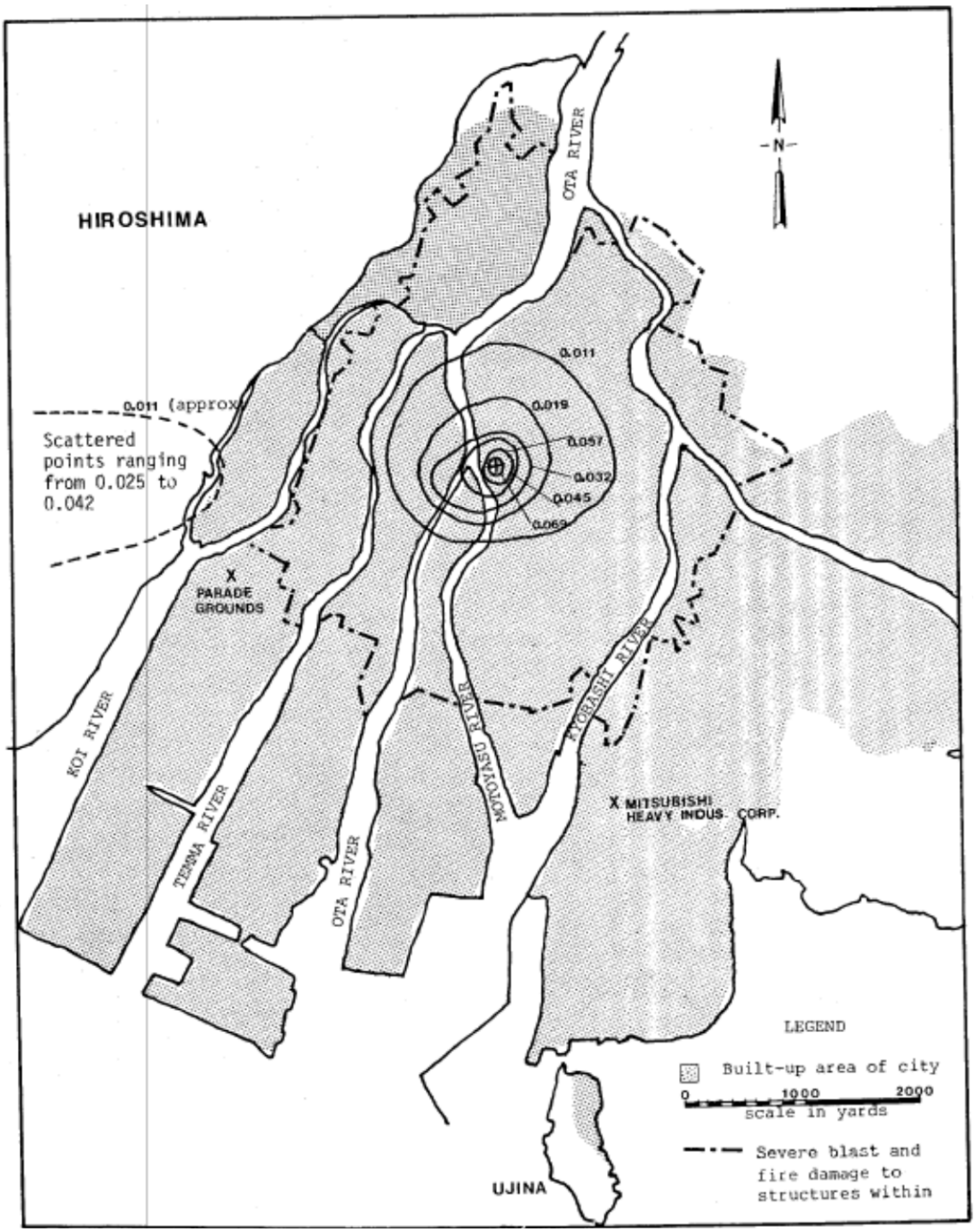

Figure 1. Results of the Naval Medical Research Institute (NMRI) survey performed in Hiroshima on November 1-2, 1945, showing residual radiation levels of 0.069 milliroentgen per hour (mR/hr) in the vicinity of ground zero[4] and 0.011 mR/hr at the outermost contour. Source: DNA 5512F.

[4] *The NMRI survey report (Measurement of the Residual Radiation Intensity at the Hiroshima and Nagasaki Atomic Bomb Sites, NMRI-160A) documents a residual exposure rate of 0.081 mR/hr at the hypocenter, as well as spot measurements of 0 and 9 mR/hr among the "scattered points" to the west of the city center. These values are not represented on the map in DNA 5512F.*

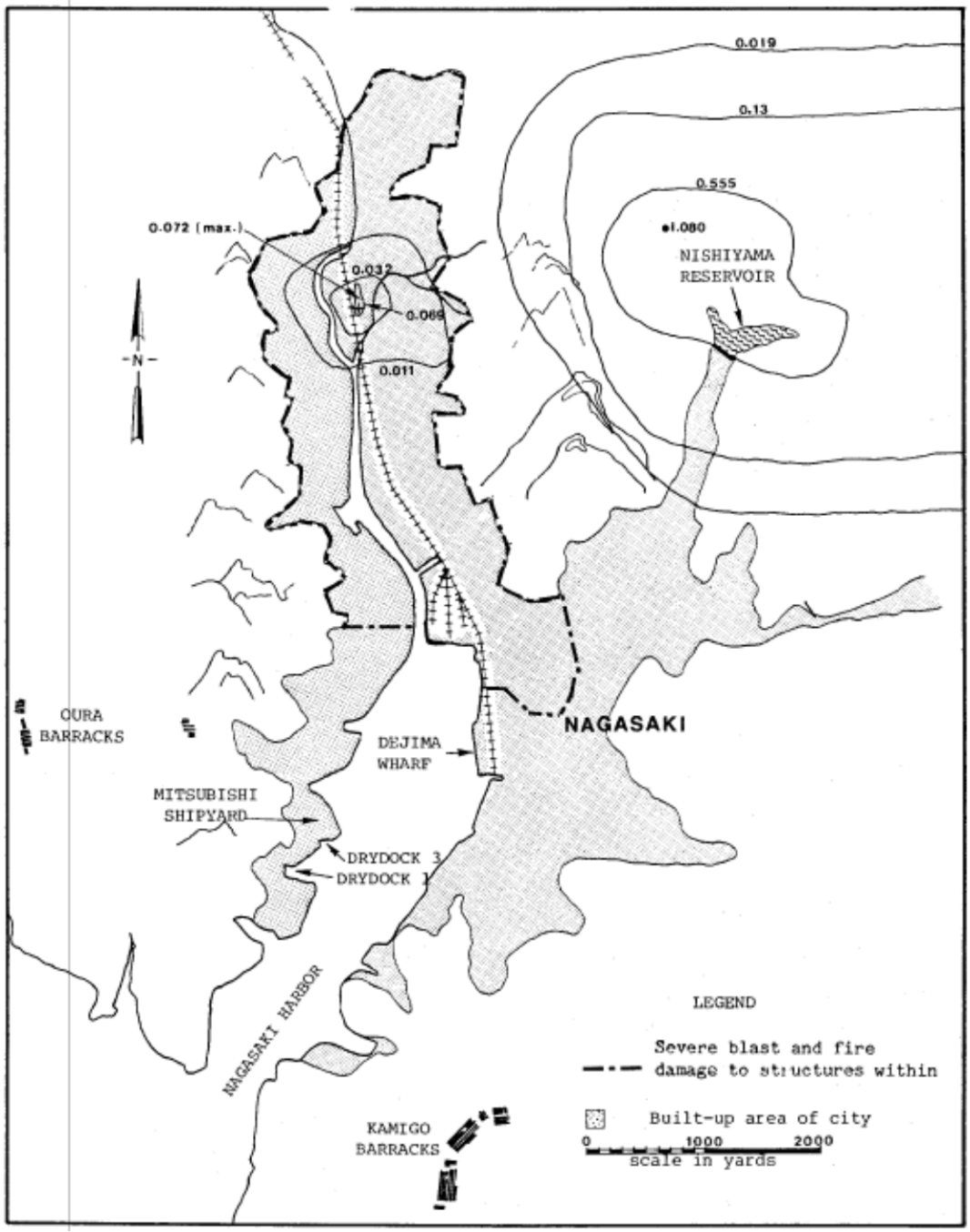

Figure 2. Results of the NMRI survey performed in Nagasaki on October 15-27, 1945, showing residual radiation levels of 0.072 mR/hr (maximum) at ground zero and up to 1.08 mR/hr in the rainout area at the Nishiyama Reservoir. Scientific analysis of these data indicated that two radionuclides resulting from neutron activation of surface soil and building materials (scandium-46 and cobalt-60) produced the radiation levels near ground zero in both Hiroshima and Nagasaki. Fission product radionuclides produced the radiation levels in the rainout areas. Source: DNA 5512F.