

## Hiroshima and Nagasaki Occupation Forces

**Overview:** Atomic bombs were detonated over Hiroshima and Nagasaki, Japan, on Aug. 6 and Aug. 9, 1945, respectively. Following the surrender of Japan on Aug. 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 arrived three 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 Oct. 6, 1945, and March 6, 1946, and in the vicinity of Nagasaki principally between Sept. 11, 1945, and July 1, 1946.

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.

### Initial 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, 4th, 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.

The total number of troops occupying Hiroshima was about 40,000. 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 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.

Refer to Title 38, Code of Federal Regulations (38 CFR), part 3.309(d)(3) for the context of the following extracted 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.*

**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.*

*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.*

*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:*

- (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 scenario:**

**Hiroshima.** Elements of the 41st Division landed at Hiro, approximately 10 miles southeast of Hiroshima, on Oct. 6, 1945, and secured the Kure Naval Yard. On Oct. 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 two 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 U.S. 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 completely free of radioactivity (see Figure 2). Over 9,000 allied (including 2,300 U.S.) POWs were processed at Nagasaki Sept. 11-23, 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 Sept. 16, 1945, and remained until the main force arrived on Sept. 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 two 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 nine miles southeast of Nagasaki, arrived in Nagasaki 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. The Hiroshima bomb was a uranium-235 weapon that detonated about 1,900 feet above the ground with a yield of 15 kilotons (kT). The Nagasaki bomb was a plutonium-239 weapon that detonated 1,650 feet above the ground with a yield of 21 kT. 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.

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 from this initial neutron and gamma radiation contributed to the lethality of 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 updrafts were produced which lifted the radioactive bomb debris, ground dust and smoke together in 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 rainshower 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 Japanese located *near ground zero at the time of the detonation*.

Based on radiation surveys by American scientists from the Manhattan Engineer District, 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.

Figure 1 depicts the results of the Naval Medical Research Institute survey taken in Hiroshima on Nov. 1-2, 1945, showing a residual radiation level of 0.069 milliroentgen per hour (mR/hr) at ground zero, and an average residual radiation level of 0.011 mR/hr in the area of rainout to the west of the city.

Figure 2 depicts the results of the Naval Medical Research Institute survey taken in Nagasaki on Oct. 15-27, 1945, showing the residual radiation level of 0.072 mR/hr (maximum) at ground zero, and a residual radiation level of up to 1.08 mR/hr in the rainout area at the Nishiyama Reservoir. Scientific analysis of these data indicated that two radionuclides, scandium-46 and cobalt-60, which resulted from neutron activation of surface soil and building materials, produced the radiation levels near ground zero in each city. Fission product radionuclides produced the radiation levels in the rainout areas.

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, and (3) the documented arrival and departure dates of each military unit which operated in the vicinity of Hiroshima and Nagasaki.

Using the "worst case" assumptions that lead to the highest radiation dose consistent with a military unit's potential for exposure, the dose reconstructions show that the maximum total\* radiation dose any member of the U.S. occupation forces in Japan could have received was less than 1 rem.\*\* The average dose received by individuals in the Hiroshima and Nagasaki occupations was less than 0.01 rem. More than 95 percent of all Hiroshima and Nagasaki participants received a dose less than 0.1 rem, which is the annual radiation dose limit for the U.S. general public currently in effect.

Similar dose reconstructions indicate that U.S. servicemen who survived imprisonment in Japanese camps received virtually no radiation dose, with the exception of the POWs held in the camp at Kumamoto. Fallout was detected in this city downwind of Nagasaki.

The range of total doses for occupation forces, POWs, and transient personnel is:

Category of Defined Participants	Percentage of Defined Participants	Probable Dose (rem)	Maximum Dose (rem)
Occupation forces - Nishiyama area and POWs - Kumamoto Camp	4%	<0.1	<1
Other Hiroshima/Nagasaki occupation forces	36%	<0.01	<0.1
Naval ship crews	43%	0.0	<0.01
Disembarked troops (for elsewhere in Japan)	13%	0.0	<0.01
Transients on railroads	2%	0.0	<0.01
Repatriated POWs	2%	0.0	<0.01

These doses are in contrast to the reconstructed initial radiation doses, which ranged between about 10 rem to hundreds of rem for the hundreds of thousands of Japanese survivors whose health continues to be monitored by the Radiation Effects Research Foundation (RERF). The RERF (formerly known as the Atomic Bomb Casualty Commission) members are officials from the Japanese Department of Health and the American National Academy of Sciences. For further information on these studies contact:

Director, Board on Radiation Effects Research  
National Academy of Sciences  
(Room 342)  
2101 Constitution Avenue, NW  
Washington, D.C. 20418

For additional information on the RERF, contact the Director of the Board on Radiation Effects Research, telephone (202) 334-2836, or visit the RERF's Internet site (<http://www.rerf.or.jp/eigo/experhp/rerfhome.htm>).

\* Sum of external and internal dose, where internal dose is the 50-year committed effective dose equivalent.

\*\* A rem is a unit that quantifies the biological effect of ionizing radiation (gamma, x-ray, beta, neutron or alpha) on man. Ionizing radiation is any radiation capable of displacing electrons from atoms or molecules, thereby producing ions. The general U.S. population receives about 0.36 rem per year (National Council on Radiation Protection and Measurements (NCRP), Report No. 93, Table 8.1) from natural background radiation sources (radon, cosmic rays and rocks) and man-made radiation sources (medical diagnostic x-rays and consumer products). The standard diagnostic chest x-ray delivers a dose of about 0.02 rem. For more information about NCRP Report 93, contact the

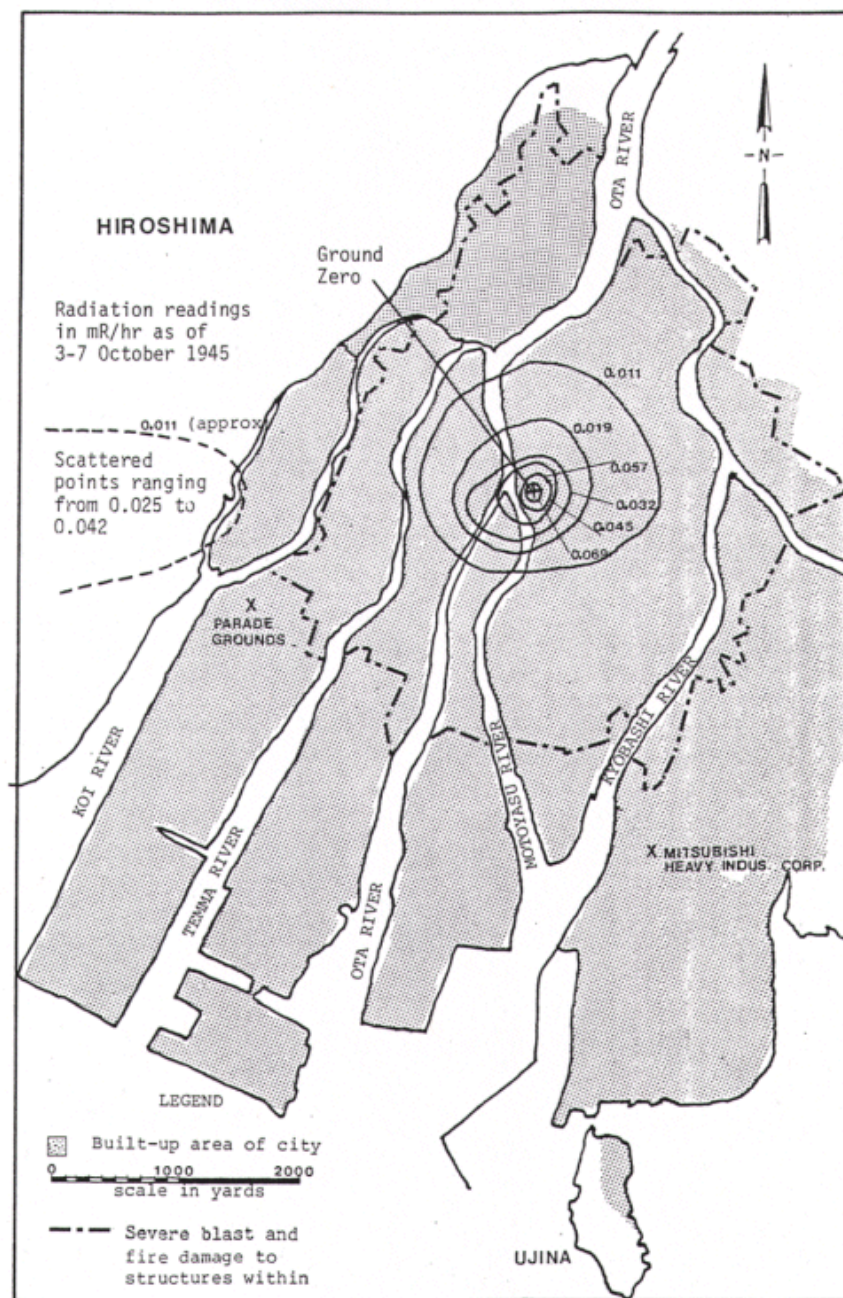


Figure 1. Hiroshima Damage and Radiation Areas



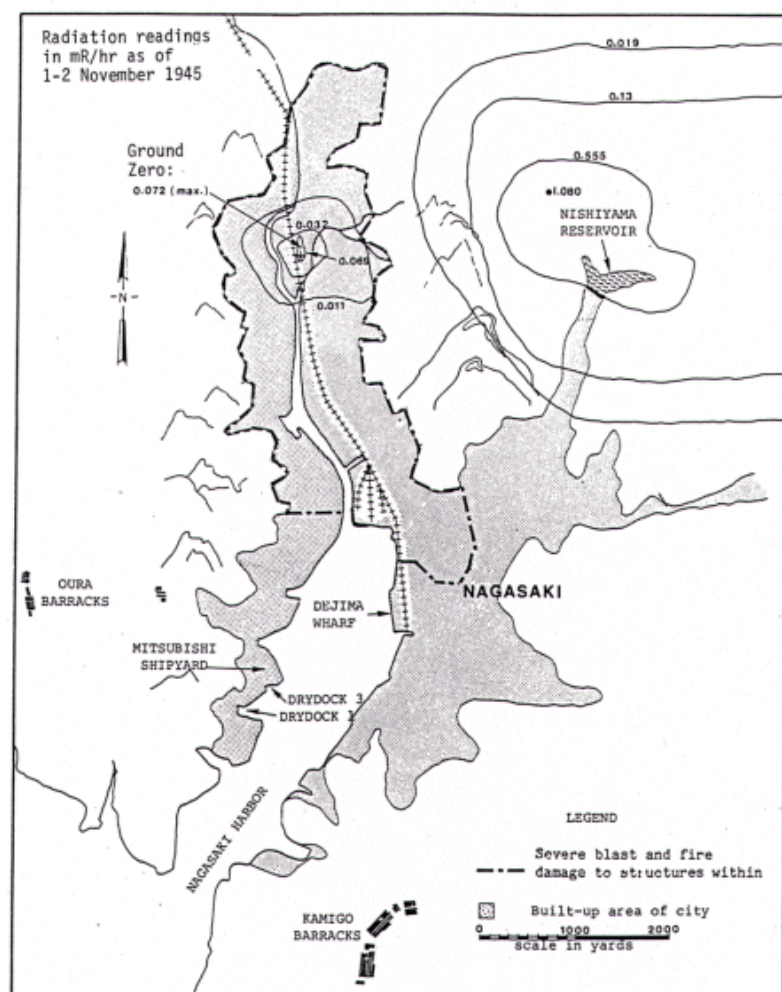


Figure 2. Nagasaki Damage and Radiation Areas

*Current As of January 2000*

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