



## Overview

Section 2 [www.AtomicBombMuseum.org/1\\_devastation.shtml](http://www.AtomicBombMuseum.org/1_devastation.shtml)

### *The unspeakable second's explosive sequence:*

**0.0 second:** Temperature at burst point reaches several million degrees F within one-millionth of a second following detonation. All bomb material becomes ionized gas & gamma rays.

**0.1 second:** Bomb explodes and fireball forms. In addition to heat and blast force, radiation was 3% of total energy, of which gamma rays & neutrons damaged living organisms, soil and ground structures.

**0.15 second:** Shock wave expands rapidly, heating air to luminous condition. Fireball visible for following 10 seconds.

**0.2 second:** Thermal energy, especially infrared wave-lengths, causes most of thermal burns to humans.

**1.0 second:** Fireball reaches maximum diameter of 200-300 meters.

Blast (50% of energy) is now complete. Overpressure at hypocenter (or "ground zero," directly below the burst point) in Hiroshima reaches an estimated 4.5–6.7 tons per square meter, and moves through the air and across the ground at the approximate speed of sound. Maximum pressure at Nagasaki's hypocenter may have been as high as 10 tons per square meter.

Recent research has found that in the initial "non-instant" (0.0 sec.) a powerful neutron burst struck a mile-wide area directly below burst point *before* the bomb casing exploded. This pre-explosion burst was caused by the initial impact of the uranium bullet with the core of uranium 235. This finding resolved a long-perplexing question of a young man near ground zero who died (Sept. 3) with symptoms of severe internal bleeding but no surface burns.



\*Atomic cloud rises over Hiroshima; photo taken from the B-29 *Enola Gay* about 30 seconds after the A-bomb exploded. (HIMAT)

In Nagasaki, the more powerful bomb destroyed an estimated 12,000 buildings by blast and burning. Virtually nothing was left standing of the valley's homes, schools and factories. Worshippers in shrines, temples, and churches perished as they prayed.

In both cities, fires generated by the explosions' intense heat, and fed by broken gas and electrical lines, raged out of control. Fire stations and equipment had been destroyed, fire fighters were dead or injured, and water pipes were ruptured.

*Many corpses were found at places where there was some water—rivers, old wells, fire-safety cisterns, ponds, and the like. People who did not die instantly had, it appears, exerted themselves to the limit just to find some water.—Marina Transport Rescue Team member, Hiroshima.*

Hiroshima's gigantic firestorm leveled 13 square kilometers (5 sq. mi.), destroying some 92% of the city's structures. Nagasaki's firestorm, hemmed in by the valley, consumed some 22.7% of the entire city's structures. The bodies of many people who were close to ground zero in the two cities were shattered by blast or burned beyond recognition in the firestorms.

*Houses and trees were leveled as far as the eye could see, and fires began breaking out in the ruins. At the roadside I saw the corpse of a man who had been leading a horse cart, still on his feet, with his hair standing on end like wire.... The river was filled with the dead and half-dead; burned children were screaming, 'Mommy! Mommy!' and mothers searched for their children, calling their names in faltering voices.—Ms. Hide Kurokawa, Nagasaki.*

Last Modified on 12/2005  
Copyright© 2005 AtomicBombMuseum.org