

Operation DOMINIC I

Note: For information related to claims, call the Department of Veterans Affairs (VA) at 800-827-1000 or the Department of Justice (DOJ) at 800-729-7327. For all other information, call the Nuclear Test Personnel Review (NTPR) Program at 800-462-3683.

Operation DOMINIC I was a series of 36 atmospheric nuclear detonations conducted in the Pacific Ocean from April to November 1962. These detonations are listed on the accompanying table. Along with the continental DOMINIC II tests, these were the last atmospheric nuclear tests conducted by the United States.

Historical Background

Most of the DOMINIC I test shots were detonated in the air after being dropped from a B-52 bomber. Twenty-four of the airdrops took place from April 25 through July 11 over the ocean just south of Christmas Island, a United Kingdom possession located 1,200 nmi (2,224 km) south of Honolulu, Hawaii. Five more airdrops were detonated in October over the open ocean in the vicinity of Johnston Island, a United States possession 780 nmi (1,445 km) west-southwest of Honolulu. These tests were conducted for the purpose of weapon development. Five high-altitude bursts (up to 400 km) were lofted by rockets from Johnston Island and were designated the FISHBOWL events. These events were for the purpose of studying the effects of nuclear detonations as defensive weapons against ballistic missiles. In addition, the Navy conducted two nuclear tests in the open ocean, on May 4 about 435 nmi (806 km) east of Christmas Island and on May 11 370 nmi (686 km) southwest of San Diego, Calif. The first, FRIGATE BIRD, was a missile-launched airburst, a proof test of the Polaris weapon system launched from the submarine USS ETHAN ALLEN (SSBN-608). The second, SWORDFISH, was the test of the Navy ASROC system, a rocket-launched antisubmarine nuclear depth charge.

As in previous test series in the Pacific, a joint military and civilian organization conducted these tests, Joint Task Force Eight (JTF 8). JTF 8 was made up of military personnel from all the services and civilians from the Department of Defense (DoD), the Atomic Energy Commission (AEC), the U.S. Public Health Service (USPHS), and contractor organizations. Commander JTF 8 (CJTF 8) was appointed by the Joint Chiefs of Staff (JCS) and reported to the AEC as well as the JCS.

Radiation Protection Standards

CJTF 8 was assigned overall responsibility for radiation safety. The Radsafe Branch, located organizationally in the Operations and Plans Office of Headquarters JTF 8, was responsible for overall control of monitoring and decontamination, issuing radiological safety supplies and equipment, maintaining radiac instruments, procuring all film badges, developing and interpreting exposed badges, and maintaining cumulative radiation exposure records for everyone who was badged. These records were compiled and are extant in a document referred to as the Consolidated List of Exposures. The Radsafe Branch also managed an extensive offsite radiation surveillance network on 17 remote islands throughout the Pacific Ocean. Task groups, which were subordinate to JTF 8, had command responsibility for radiological safety within their organizations.

The maximum permissible exposure (MPE) for personnel who participated in DOMINIC I was 3.0 roentgens (R) gamma per consecutive 13-week period, with a maximum of 5 R for the calendar year. Individuals who were 18 years old could accrue no more than 1.25 R per 13-week period during their 19th year. No individual who had not reached his 18th birthday by May 1, 1962, could be occupationally exposed to radiation. A special MPE of 20 R gamma was authorized for the operational period for aircrews, maintenance crews, and recovery crews associated with air-sampling aircraft.

Film badges were issued to personnel stationed on Christmas and Johnston Islands and those in Navy ships directly involved with the tests. Persons on remote islands monitoring for radiation or conducting experiments were not badged. The majority of the approximately 25,000 participants in DOMINIC I were badged. Badges were issued for extended periods to ensure that all possible exposure was recorded.

Because all but one of the shots were airbursts, there was little or no fallout and no residual radiation around surface zero. Although SWORDFISH (the underwater shot) produced no fallout, it did create a short-lived radioactive base surge consisting of radioactive water droplets and a pool of radioactive water centered at surface zero. The base surge reached its largest upwind and crosswind distance of approximately 2,000 yards about 110 seconds after the shot. At that time, it extended about 2,500 yards downwind. The base surge remained visible for about 10 minutes but persisted as an invisible aerosol for at least 20 minutes. The pool of radioactive water was defined by the margins of a disk-shaped foam patch on the ocean surface. The foam patch, which became visible on the surface as the base surge dispersed and evaporated, had a radius of about 2,000 yards, approximately the same as the base surge except for its downwind extension. The radioactive pool dispersed after a few days. Aside from USS SIOUX (ATF 75), a ship tasked with sampling the pool of radioactive water, the closest ship was USS BAUSELL (DD 845) at 2,200 yards upwind from surface zero. BAUSELL, however, did not enter the radioactive pool or encounter the base surge.

Because stringent personnel safety measures were enforced during the cleanup after the launch pad explosion of BLUEGILL PRIME at Johnston Island, no one received significant contamination from the accident.

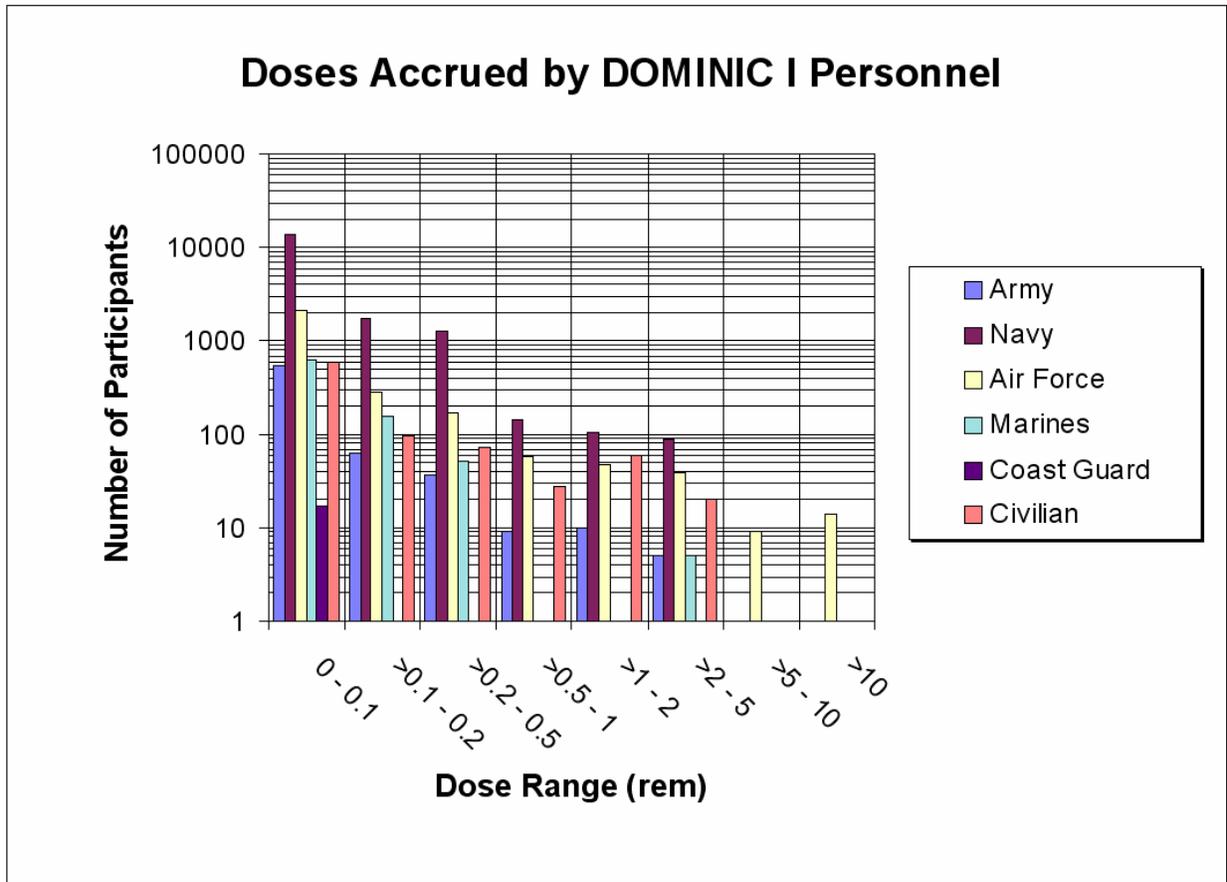
Radiation Doses at DOMINIC I

Approximately 5 percent (some 1,200 personnel) of DOMINIC I participants had doses greater than 0.5 rem.* Approximately 230 personnel had doses greater than 2.0 rem, with some 40 personnel receiving doses over 5.0 rem. Included in this group are 20 personnel with doses greater than 10.0 rem; the highest total dose for the entire operation was 17.68 rem.

It is well documented that many badges worn by personnel during DOMINIC I were defectively sealed, which resulted in damage to the films from moisture, light and heat. Film damage typically caused optical density (darkening) in addition to that from radiation, which was, nonetheless, historically attributed to radiation. A reevaluation of 1,349 DOMINIC I film badges in 1979-1980 showed that 45 percent exhibited some damage related to light, heat, and age, due to defective wax seals. Of the badges that showed apparent readings over 0.4 rem, 98 percent were observed to have suffered environmental damage. Subsequent research of radiological data from DOMINIC I indicates that only the following categories of participants had the potential for radiation exposure:

- Crewmembers of USS SIOUX
- Nuclear cloud sampler aircrews or associated ground crewmembers
- Personnel involved in the recovery and handling of radioactive instrumented pods, rocket nose cones, or any other contaminated material
- Radiation Safety monitors

The totals of reconstructed and film badge doses for DOMINIC I participants are depicted in the following chart.



* 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. 93, Table 8.1), the general U.S. population receives about 0.36 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).

For more information, see the report “Operation DOMINIC I 1962” (DNA 6040F), available online at http://www.dtra.mil/rd/programs/nuclear_personnel/atr.cfm.