

# Fact Sheet



## *Defense Threat Reduction Agency*

### ***Nuclear Test Personnel Review (NTPR) Program: Program Reviews and Scientific Studies (Toll Free Helpline: 800-462-3683)***

The Defense Threat Reduction Agency (DTRA) is the Department of Defense (DoD) executive agent for the Nuclear Test Personnel Review (NTPR) Program. It serves approximately 550,000 DoD personnel who participated in five missions: 1) post-World War II occupation forces of Hiroshima and Nagasaki; 2) prisoners of war in Japan at the conclusion of World War II; 3) participants of U.S. atmospheric nuclear tests (1945 - 1962), conducted primarily in Nevada and the Pacific Ocean; 4) participants of U.S. underground nuclear testing between (1951 - 1992), conducted primarily in Nevada; and 5) radiological clean-up of the Pacific Proving Ground. The primary purpose of the NTPR Program is to provide participant data and radiation dose information for atomic veterans.

#### **Program Reviews**

In 1985, the NTPR dose reconstruction methodology was published in Title 32, Code of Federal Regulations, Part 218 (32 CFR 218). Since that time, the scientific methods used by the NTPR Program have been reviewed several times by the Government Accountability Office (GAO, formerly the General Accounting Office), the National Research Council (NRC) of the National Academy of Sciences (NAS), and the Veterans' Advisory Board on Dose Reconstruction (VBDR).

#### **GAO:**

The GAO is the investigative arm of Congress, chartered to study the programs and expenditures of the federal government in an independent and nonpartisan fashion. The GAO was directed by Congress to perform four independent reviews of the NTPR Program:

- ["Operation CROSSROADS: Personnel Radiation Exposure Estimates Should be Improved" \(1985\)](#)  
This review was commissioned to examine issues regarding radiation safety activities during Operation CROSSROADS, a U.S. atmospheric nuclear test series conducted at Bikini Atoll in 1946. The report concluded that some adjustments to the radiation exposure estimates calculated for test participants may be necessary because allowances were not made for film badge inaccuracies, comprehensive personnel decontamination procedures were either inadequate or not implemented, exposure estimates from ingestion or open wounds were not calculated, and inhalation estimates may have been underestimated.
- ["Nuclear Health and Safety: Radiation Exposures for Some Cloud-Sampling Personnel Need to be Reexamined" \(1987\)](#)  
This review was commissioned to determine the number of personnel involved in nuclear cloud sampling activities at three selected operations and how much radiation exposure they may have received. The report concluded that external exposure for some personnel was understated and required

reexamination. In addition, protective breathing devices were not consistently used by ground personnel working around contaminated aircraft, necessitating reevaluation of their internal radiation exposures.

- [“Nuclear Health and Safety: Mortality Study of Atmospheric Nuclear Test Participants is Flawed” \(1992\)](#)  
This review was commissioned to determine the accuracy of the participation and radiation exposure data supplied to the NAS for its 1985 report “Mortality of Nuclear Weapons Test Participants.” The report concluded that the magnitude of the inaccuracies in the data used by the NAS raised serious questions about the study’s findings, and that the study should be repeated.
- [“Veteran’s Benefits: Independent Review Could Improve Credibility of Radiation Exposure Estimates” \(2000\)](#)  
This review was commissioned to evaluate the validity of dose reconstruction as a tool for estimating radiation exposures, to examine alternatives for deciding radiation-related claims, and to determine what oversight activities are in place. The report concluded that dose reconstruction is a valid method for estimating doses and identified no better alternatives for deciding radiation-related claims. However, concerns were expressed regarding the lack of independent review, specifically quality control and peer review. Establishing an independent review process could build greater public confidence in the dose reconstruction program.

#### NAS/NRC:

The NAS is a non-profit organization chartered and mandated by Congress to advise the federal government on scientific and technical matters. The NRC, acting as the principal operating agency of the NAS, has performed various reviews of the NTPR Program:

- [“Review of the Methods Used to Assign Radiation Doses to Service Personnel at Nuclear Weapons Tests” \(1985\)](#)  
The purpose of this study was to evaluate whether the methods used by the NTPR Program to assign radiation doses were comprehensive and scientifically sound, but did not include audits of dose reconstructions for specific veterans. The review committee concluded that the procedures used to estimate external doses were reasonably sound, and that a bias may exist that probably tends to overestimate the most likely dose (especially for internal emitters). The committee had concerns about the methods for estimating internal doses, but conceded that inhalation exposures had only a minor impact on total doses.
- [“Film Badge Dosimetry in Atmospheric Nuclear Tests” \(1989\)](#)  
This study was an evaluation of dosimetry practices used during weapons testing, concluding that it was feasible to estimate participant radiation doses with reasonable certainty. It included methods for addressing uncertainties in dosimetry readings and the conversion of readings to organ doses.
- [“A Review of the Dose Reconstruction Program of the Defense Threat Reduction Agency” \(2003\)](#)  
Prompted by the GAO (2000) report to Congress, this review included random sampling of dose reconstructions. Known as the “green book” by many veterans, the review recommended improvements to the NTPR dose reconstruction process that have since been instituted by DTRA.

#### VBDR:

[The VBDR](#), established under the provisions of Section 601(c) of Title VI of Public Law 108-183 (2003) and the Federal Advisory Committee Act of 1972, was jointly chartered by DTRA and VA to provide independent oversight of DTRA’s radiation dose reconstruction. Between 2005 and 2013, the VBDR provided 21 recommendations to DTRA, all of which were accepted. These recommendations resulted in significant advances in radiation dose reconstruction and associated quality assurance procedures.

## Scientific Studies

The NTPR Program supports independent scientific studies to ascertain whether U.S. atmospheric nuclear test participants have experienced adverse health effects as a result of their participation. Three pertinent cohort epidemiological studies are summarized below:

- [“Mortality of Veteran Participants in the CROSSROADS Nuclear Test” \(1996\)](#)  
Conducted in the Pacific in 1946, Operation CROSSROADS was the first peacetime atmospheric nuclear test series. This Medical Follow-up Agency (MFUA), Institute of Medicine (IOM) study focused on a cohort of approximately 40,000 Navy participants, finding that these participants experienced a 4.6 percent increase in mortality (deaths from all causes when compared with a comparable number of military personnel who were not participants). This finding was statistically significant at the 95 percent confidence level. When malignancies (cancer) and leukemia were considered, participant mortality was slightly elevated, but the results were not statistically significant. The increase in mortality from all causes did not concentrate in any disease group examined, and the results did not vary when participants engaging in higher exposure occupations were compared to the rest of the participants. This report concluded that exposure to radiation was not the cause of the increase in mortality from all causes among CROSSROADS participants.
- [“The Five Series Study: Mortality of Military Participants in U.S. Nuclear Weapons Tests” \(2000\)](#)  
To overcome the limitations of a similar study completed in 1985 (“Mortality of Nuclear Weapons Test Participants”), this MFUA-IOM study focused on a cohort of approximately 68,000 military personnel who participated in at least one of five selected U.S. atmospheric test series: Operations GREENHOUSE (1951), UPSHOT-KNOTHOLE (1953), CASTLE (1954), REDWING (1956), and PLUMBBOB (1957). The risk of death for test participants was compared to that of a control group of approximately 65,000 comparable military personnel who were not test participants. The study concluded:
  - Overall, participants and controls had basically the same risk of death from all causes;
  - Overall, participants did not experience widespread early death;
  - Participants and controls had basically the same risk of death from cancer;
  - Excess cancer (leukemia, nasal, and prostate) deaths among participants amounted to less than about 100 cases, which the NAS concluded could be attributed to chance as well as participation;
  - Statistical significance in risk of participant death was noted as follows:
    - Increased risk overall from external causes, such as motor vehicle accidents;
    - Increased risk overall from nasal cancer and prostate cancer;
    - Increased risk from leukemia in Nevada Test Site (UPSHOT-KNOTHOLE and PLUMBBOB) participants;
    - Increased risk of death from all causes in Pacific Ocean (GREENHOUSE, CASTLE, and REDWING) participants.
- [“The Eight Series Study: Mortality of Military Participants in U.S. Nuclear Weapons Tests” \(2020\)](#)  
This National Council on Radiation Protection and Measurements study of ~114,000 atomic veterans that were part of MFUA-IOM Operation CROSSROADS and Five Series studies, Operation HARDTACK I series and Project TRINITY. This atomic veteran study investigates correlation of standardized mortality ratios, by disease, with ionizing radiation organ doses, while accounting for confounding factors. No statistically significant radiation associations were observed among 114,270 nuclear weapons test participants followed for up to 65 years. The 95% confidence limits were narrow and excluded mortality risks per unit dose that are two to four times higher than those reported in other investigations. Significantly elevated SMRs were seen for mesothelioma and asbestosis, attributed to asbestos exposure aboard ships.

## **NTPR Inquiries**

Individuals seeking information about the NTPR Program can address their inquiries to:

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