GAO

United States General Accounting Office

Report to the Chairman, Committee on Veterans' Affairs, U.S. Senate

August 1992

NUCLEAR HEALTH AND SAFETY

Mortality Study of Atmospheric Nuclear Test Participants Is Flawed

147518

GAO/RCED-92-182

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-248414

August 10, 1992

The Honorable Alan Cranston
Chairman, Committee on
Veterans' Affairs
United States Senate

Dear Mr. Chairman:

In 1979 the Centers for Disease Control (CDC) issued a report on the effects of low levels of radiation on former servicemen who had participated in the 1957 atmospheric nuclear test code-named SMOKY. Because the report raised much concern that the leukemia-causing effects of low doses of radiation may have been seriously underestimated, in 1979 the Defense Nuclear Agency requested that the National Academy of Sciences study the effects of radiation on participants at other atmospheric tests. In May 1985 the Academy issued its report entitled Mortality of Nuclear Weapons Test Participants, which concluded that, in general, the mortality rate from cancer in the five test series reviewed was less than that which would be expected in the general population. However, new information developed by the Defense Nuclear Agency in 1989 raised concerns that the conclusions of the Academy's study may have been based on inaccurate data.

As a result, you asked us to provide information on the actions or omissions by federal agencies in connection with the May 1985 National Academy of Sciences' report. Subsequently, we agreed to review (1) how accurate were the participant and radiation exposure data that were supplied to the Academy, (2) when and how inaccuracies in the data were discovered, (3) when and how the inaccuracies occurred, and (4) what actions have been taken to correct the data and update the 1985 mortality study.

Results in Brief

The individual military services developed the participant data bases for the five selected atmospheric nuclear test series. While the data bases were considered accurate when the National Academy of Sciences' report was issued in May 1985, they were limited to the participants identified as of March 1983. After the Academy's report was issued, the individual military services continued to develop the participant data bases until 1987, when the Defense Nuclear Agency assumed this responsibility.

In July 1989 the Defense Nuclear Agency completed consolidating and refining the individual military services' data bases and compared its new data base with the data base used in the 1985 National Academy of Sciences' study. As a result of this comparison, the Defense Nuclear Agency discovered that almost 15,000 of the 47,435 individuals assessed as part of the 1985 mortality report did not participate in the tests. The Defense Nuclear Agency also identified about 28,000 participants who were present at the tests but not included in the Academy's study. According to Defense Nuclear Agency officials, the inaccuracies resulted from the pressure to complete the work, the inexperience of the data gatherers, and difficulty in obtaining complete and accurate records. For example, in some cases, inexperienced data gatherers listed all members of a military unit as present at a test even though later examination of additional records indicated that all members of the unit were not present.

The radiation exposure data provided to the National Academy of Sciences by the Defense Nuclear Agency and the individual military services also contained inaccuracies, according to the Academy. These inaccuracies occurred because some of the exposure data had been incorrectly transcribed; as a result, the exposure data were understated. The Academy's researchers discovered the inaccuracies between 1977 and 1983 during the course of their review of the exposure data and placed a caveat in the Academy's May 1985 report cautioning that the exposure data should be taken as approximations only.

When Defense Nuclear Agency officials discovered the inaccuracies in the participant data base in 1989, they began discussions with the National Academy of Sciences to validate the data and update the 1985 mortality study. Still, until August 1991, the Defense Nuclear Agency continued to provide information on the study's conclusions to requesters of the information without telling them that the inaccuracies in the participant data may affect the validity of the study's findings. The Defense Nuclear Agency expects to issue a contract to the Academy by the end of July 1992 to update the May 1985 study.

Background

Starting in 1946, and continuing through 1962, the United States conducted more than 200 atmospheric tests of nuclear weapons involving about 213,000 Department of Defense (DOD) personnel. In 1979 CDC issued a report on the effects of low levels of radiation on former servicemen who had participated in one such test, code-named SMOKY, in a series, code-named PLUMBBOB, which took place at the Nevada Test Site in

1957. The report indicated that eight cases of leukemia had been identified among the 3,224 former servicemen who had participated in this test. This represented an excess of 4.5 cases over the 3.5 cases expected on the basis of age- and sex-specific population rates.

Because the 1979 CDC report raised much concern that the leukemia-causing effects of radiation at low doses may have been seriously underestimated, in 1979 the Defense Nuclear Agency requested that the National Academy of Sciences (specifically, the National Research Council's Medical Follow-up Agency) study the effects of radiation on participants at other atmospheric test shots (detonations).[1] Funding for the study was provided by the Defense Nuclear Agency and the Department of Energy. The UPSHOT-KNOTHOLE (1953) and PLUMBBOB (1957) series were selected from those conducted at the Nevada Test Site, and the GREENHOUSE (1951), CASTLE (1954), and REDWING series (1956) from those conducted at Bikini and Enewetak atolls in the Pacific.

In May 1985 the National Academy of Sciences reported the results of its study. The report, entitled Mortality of Nuclear Weapons Test Participants, concluded that, in general, the mortality rate from cancer, including leukemia, in all five test series selected was less than that which would be expected in the general population. In addition, the mortality rate for other diseases was much less than expected.

Accuracy of Data Supplied to the National Academy of Sciences

To perform the mortality study, the National Academy of Sciences obtained basic information from the individual services and the Defense Nuclear Agency. Specifically, lists of military personnel who participated in the atmospheric nuclear tests were obtained from the individual military services, and data on the estimated and reconstructed radiation exposures were provided by both the individual military services and the Defense Nuclear Agency.

When the National Academy of Sciences performed the mortality study, it was believed that the participant data bases contained all military personnel who, by documentation available as of March 1983, could be shown to have participated in one or more of the selected atmospheric test operations. However, the study pointed out that identifying military personnel who participated in the nuclear atmospheric tests, a process begun in 1977, was still not complete. Therefore, the Academy's mortality

[1]The Defense Nuclear Agency has served as DOD's executive agency for all matters concerning the participation of DOD personnel in atmospheric nuclear tests.

study included only those participants identified in the selected operations by the services as of March 1983—a total of 47,435 participants. Not until 1989, 4 years after the study was issued, did questions arise over the accuracy of the participant data.

With respect to the radiation exposure information supplied by the Defense Nuclear Agency and the individual services, the National Academy of Sciences' study stated that

"Close examination of the data concerning individual badge readings leads to the conclusion that the readings are not necessarily accurate. Mispunching of dates, service numbers, names, and even dose readings occurred. The doses, therefore, must be taken as only approximately accurate."

According to one of the principal authors of the study, film badges[2] were not sensitive to neutron radiation and also did not measure internal radiation doses received from ingested or inhaled radionuclides contained in fallout or neutron-activated materials. Therefore, the National Academy of Sciences considered the film badge data to have a low bias. Although reconstructed dose estimates purposely overestimated these sources of exposure, the Academy's study cautioned that the true radiation doses could be underestimated and should be taken as approximations only.

When and How the Inaccuracies Were Discovered

The inaccuracies in the participant data base were discovered by the Defense Nuclear Agency in July 1989. The Defense Nuclear Agency assumed responsibility for maintaining a consolidated data base of atmospheric nuclear test participants in October 1987. Previously, the individual services maintained separate data bases. In July 1989 the Defense Nuclear Agency completed consolidating and refining the individual participant data bases, and at that time, compared its updated data base with the data bases used by the National Academy of Sciences to prepare its 1985 study. As a result of this comparison, the Defense Nuclear Agency found that 14,854 of the 47,435 individuals included in the 1985 National Academy of Sciences' mortality study did not participate in the atmospheric tests. Furthermore, the updated data base contained 28,215 additional personnel (identified after the March 1983 cut-off date used in the Academy's mortality study) who did participate in the nuclear tests. (App. I shows the differences found in the data for each of the five test-shot series and the reasons for the differences.)

[2]A film badge utilizes photographic film to measure the radiation dose received by the wearer. The badge is usually clipped to an outer garment above waist level. The dose is calculated from the degree of film-darkening that results from exposure to radiation.

As discussed in the previous section, the inaccuracies in the radiation exposure data were discovered during the study by the National Academy of Sciences through a review of the individual badge-reading data.

When and How the Inaccuracies Occurred

The inclusion of military personnel not present at the test sites in the participant data bases provided to the National Academy of Sciences was the result of several factors occurring throughout the initial data collection effort (1977-83). According to Defense Nuclear Agency officials, the inaccuracies resulted from the difficulty in obtaining complete and accurate records, pressure to complete the work, inexperience of the data gatherers, and lack of funds.

In 1977 military service teams began the difficult task of identifying the military personnel who were present at the atmospheric tests conducted from 1946 through 1962. This required obtaining and reviewing ships' logs, duty rosters, morning reports, and other contemporaneous documents to tentatively identify participants and then search individual service and medical records that were often incomplete, inaccurate, or confusing. According to Defense Nuclear Agency officials, this effort was hampered because some records may have been destroyed to make room for new files or were not archived in such a way as to facilitate later retrieval. In addition, in 1973 a fire at the National Personnel Records Center, located in St. Louis, Missouri, destroyed about 80 percent of the Army and Air Force records for World War II and the Korean conflict. For example, the fire destroyed over 16 million individual Army service records, which covered about 80 percent of the time period from 1946 through 1963.

Defense Nuclear Agency officials said that during the early 1980s, the news media, the Congress, and servicemen who participated in the nuclear testing program were placing a great deal of pressure on the services and the Defense Nuclear Agency to provide information on the effects of the atmospheric tests. The officials said that the individual services were scrambling by any means possible to pull together data on personnel who might have participated in the tests, which included using any staff that were available as team members. As a result, many of the service team members were newly trained personnel with no experience or other available staff who were unfamiliar with personnel records or what specifically to look for in the records. This meant that many of the team members received on-the-job training. According to these Defense Nuclear Agency officials, in some cases, inexperienced service team members listed all members of a military unit as being present at a test even though

later examination of additional records indicated that all members of the unit were not present. They said, however, that as the team members gained experience, the quality and accuracy of the data improved.

According to the National Academy of Sciences' mortality study, the exposure data provided by the Defense Nuclear Agency and, in some cases, the individual services were not totally accurate. One of the principal authors of the study said that in the process of verifying and completing the participant data, he found that some of the individual film badge-reading data used to estimate exposures to individuals who did not wear a film badge were inaccurate. For example, some of the exposure data were obviously incorrect because the type of film badge used could not detect exposures as low as those indicated. According to this author, this problem probably resulted from the mispunching of information from film badge cards during transcription.

Actions Taken in Response to the Identification of Inaccuracies

Shortly after the participant data bases were found to contain individuals not present at the test shots, the Defense Nuclear Agency began exploring the possibility of updating the mortality study. The Defense Nuclear Agency made no effort to inform those who may have received the 1985 mortality study or abstracts of the study that the conclusions reached in the study might not have been valid. However, in August 1991 Defense Nuclear Agency officials decided to stop sending out the abstracts because they believed that a qualifying statement would only raise questions about the flaws in the report and cause it to be misunderstood.

Efforts to Update the 1985 Study

When the magnitude of the inaccuracies in the participant data became known in July 1989, both the Defense Nuclear Agency and the National Academy of Sciences began discussions on what should be done to validate the data and update the study. First, informal discussions took place between the principal author of the study and the Defense Nuclear Agency concerning when the study could be updated. This was followed by an August 30, 1989, letter to the National Academy of Sciences from the Defense Nuclear Agency requesting that the Academy develop a new study protocol, a cost estimate to perform the study, and an estimated completion date. In April 1990 the Academy responded with a proposed study that would cost about $2.5 million and take about 4 years to complete. The Academy said that such a study could begin on January 1, 1991.

The Defense Nuclear Agency completed its internal technical review of the National Academy of Sciences' proposal by June 11, 1990, and recommended that the proposal be accepted. However, according to the Defense Nuclear Agency officials, the follow-up study was delayed because the Academy's staff were not expected to be available to perform the study until January 1991. Also, funding for the proposed study was not expected to be available until January 1991.

On March 1, 1991, the Defense Nuclear Agency's Contract Review Board met to discuss the merits of awarding a sole-source contract to the National Academy of Sciences to update the 1985 mortality study. During the discussion, the importance of having an internationally renowned organization perform the study was emphasized. Although the Academy was identified as the only source, some Contract Review Board members questioned whether the Academy was the only prestigious organization capable of performing the study. As a result, the Contract Review Board withheld approval, pending the consideration of alternatives such as (1) issuing a "fast track" Request for Proposal (RFP) or (2) publishing a "sources sought" notice in the Commerce Business Daily. Acquisition officials decided to issue a fast track RFP to determine whether other qualified organizations could perform the follow-up study and, if not, negotiate a sole-source contract with the Academy. Therefore, on March 6, 1991, the Defense Nuclear Agency issued an RFP that was to close on April 23, 1991.

On March 13, 1991, the National Academy of Sciences informed the Defense Nuclear Agency that, although the Academy wanted to do the follow-up study, its policy prohibited it from submitting a bid on an open competition. Therefore, by the RFP's April 23 closing date, only one bid was received—that of the Oak Ridge Associated Universities.

On April 25, 1991, the Defense Nuclear Agency's Source Selection Evaluation Board was asked to evaluate the Oak Ridge Associated Universities' bid. On July 29, 1991, the Evaluation Board determined that the proposal was unsatisfactory and recommended that no award be made. On August 27, 1991, the Defense Nuclear Agency notified the Oak Ridge Associated Universities that the RFP was canceled because its bid was considered unacceptable. On September 16, 1991, the Oak Ridge Associated Universities formally protested the cancellation to us, charging that the solicitation was tainted by the Defense Nuclear Agency's presolicitation bias in favor of sole-source procurement to the National Academy of Sciences.

According to the Defense Nuclear Agency officials, until the protest was resolved, the agency was precluded from pursuing the follow-up study. On January 16, 1992, we denied the bid protest. In summary, we found no basis for concluding that the Defense Nuclear Agency's review of the protester's proposal was unreasonable or not in accordance with the criteria stated in the RFP. As of June 30, 1992, Defense Nuclear Agency officials expected to award a sole-source contract to the National Academy of Sciences by the end of July 1992, at a cost of $3.6 million. (App. II contains a complete chronology of events from 1946 to the present.)

No Steps Taken to Inform Study's Recipients of the Inaccuracies Found in the Participant Data Base

Except for the National Academy of Sciences, no other agency or individual was notified of the inaccuracies found in the participant data. When the Academy completed the 1985 mortality study, a press release was issued summarizing the study's findings and indicating that copies of the report were available from the Academy's Medical Follow-up Agency. We were unable to determine how many, if any, copies of the report were provided to the general public because, according to agency officials, they destroy their distribution lists after 3 years. However, according to one of the study's authors, initially, copies were sent to the Director of the Defense Nuclear Agency only. Shortly after the Academy's study was released, the Defense Nuclear Agency sent information concerning the study, including the press release, to about 45,000 veterans of the atmospheric nuclear weapons testing program. In addition, copies of the study were sent to about 600 institutions, which included all Department of Veterans Affairs regional office libraries, all state libraries, and libraries located in large cities.

Subsequent to the study's initial release and continuing through August 1991, the Defense Nuclear Agency, in response to thousands of inquiries concerning the atmospheric test program, sent out its standard nuclear test personnel review information package. Among other things, the package included the National Academy of Sciences' press release. However, because the Defense Nuclear Agency does not have a system to identify either the persons or organizations making inquiries or those who may have received either a copy of the study or the information package, we were unable to determine how many individuals received such information.

Defense Nuclear Agency officials told us that the package was sent out without any qualifying statement indicating that the study may be flawed

owing to inaccurate participant data because they believed that the reader could reach his/her own conclusion on the basis of the limitations cited in the package. These officials also commented that the 1985 mortality study was and is the only study with a large participant and exposure data base covering an extended period of time. They did not believe that the study's conclusions would change even if the updated participant data were used.

In August 1991 Defense Nuclear Agency officials decided to stop sending out this information package because they believed that a qualifying statement would only raise questions about the flaws in the report and cause it to be misunderstood. Also, by this time, they had already decided that a follow-up study should be done and had initiated action to do so.

To determine how the 1985 mortality study was being used, we contacted the organizations most likely to use the study for research or standard-setting. Specifically, we contacted the Departments of Energy and Veterans Affairs, CDC, and the National Council on Radiation Protection and Measurements. Agency officials told us that either they were not aware of the study or it was being used for informational purposes only. The only agency apparently citing or using the study has been the Defense Nuclear Agency.

In addition to the organizations we contacted, the Congressional Office of Technology Assessment—using a data base called the Science Citation Index—identified six journal letters or articles in which the 1985 mortality study was cited. Only two, however, addressed the study's methodology or results. One article published in the American Journal of Epidemiology reanalyzed the data for the PLUMBBOB series of tests reported in the 1985 mortality study and concluded that the study did not properly correct for the "healthy soldier bias."[3] However, in a letter to the editor of the journal, one of the authors of the 1985 mortality study disagreed with the method used by the authors to correct for this effect. Another letter criticized how the National Academy of Sciences' National Research Council Committee on the Biological Effects of Ionizing Radiations (BEIR V) used previous studies, including the 1985 mortality study, in preparing its report on the effects of low levels of ionizing radiation.[4] The three remaining articles

[3]A military population consists entirely of persons who are in apparent good health at the time of entry into the service. U.S. mortality rates, on the other hand, are based upon the experiences of the entire population, which includes those who are sick as well as those in good health.

[4]National Research Council, Committee on the Biological Effects of Ionizing Radiations, Health Effects of Exposure to Low Levels of Ionizing Radiation, National Academy Press, Washington, D.C. (1990).

merely mentioned the 1985 mortality study and presented its conclusions. (App. III lists each of these letters and articles.)

Conclusion

The inaccuracies found in the participant data bases and the exposure data were, among other things, the result of the inexperience of the service team members who gathered data, the lack of complete and accurate records, and the incorrect transcribing of data. The magnitude of errors in the participant data used in the National Academy of Sciences' 1985 mortality study raises serious questions about the accuracy of the study's findings. Given this situation, we believe that steps should be taken to inform recipients of the 1985 study that the conclusions reached may not be valid.

Recommendation

We recommend that the Secretary of Defense require the Director, Defense Nuclear Agency, to notify veteran groups, researchers, and the general public that the conclusions reached in the 1985 National Academy of Sciences' mortality study may not be valid because of inaccuracies found in the participant data used in performing the study and that the study is being redone.

Agency Comments and Our Evaluation

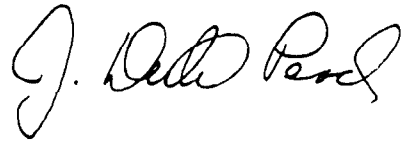
In commenting on our draft report, the National Academy of Sciences stated that it had no comments to make and DOD stated that it agreed with the report's findings, conclusions, and recommendation. DOD stated that the Defense Nuclear Agency will notify, by September 30, 1992, the appropriate institutions and veterans' organizations of the limitations of the 1985 mortality study and its plans to update that study. (See apps. IV and V.)

We performed our work between October 1991 and May 1992 in accordance with generally accepted government auditing standards. To obtain the information for this report, we reviewed Defense Nuclear Agency and National Academy of Sciences records; interviewed officials of the Departments of Energy, Defense, and Veterans Affairs and officials of the Academy and the Centers for Disease Control; and reviewed the Academy's 1985 mortality study. (See app. VI for a more detailed discussion of our scope and methodology.)

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will provide copies to the Secretaries of Energy, Defense, and Veterans Affairs; and the President, National Academy of Sciences. We will make copies available to others upon request.

This report was prepared under the direction of Victor S. Rezendes, Director of Energy and Science Issues, who can be reached on (202) 275-1441 if you or your staff have any questions. Major contributors to this report are listed in appendix VII.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

Contents

Abbreviations

BEIR	Biological Effects of Ionizing Radiation
CDC	Centers for Disease Control
DNA	Defense Nuclear Agency
DOD	Department of Defense
GAO	General Accounting Office
RFP	Request for Proposal
MFUA	Medical Follow-up Agency
NTPR	Nuclear Test Personnel Review
CRB	Contract Review Board
ORAU	Oak Ridge Association Universities
SSEB	Source Selection Evaluation Board
OTA	Office of Technology Assessment

Participant List Comparison

Table I.1 shows the number of service personnel inaccurately included in the National Academy of Sciences' 1985 mortality study, the number of participants identified after the March 1983 cut-off date used in the 1985 mortality study, and the reasons for the discrepancies.

Table I.1: Participant Data List Comparison—March 1983 and July 1989

Test shot/series	Number inaccurately included	Number subsequently identified	Reasons for errors
CASTLE	2,635	4,459	Many Air Force and Army records were missing.
GREENHOUSE	599	6,159	Almost all Air Force and Army data were missing. Navy data were incomplete.
PLUMBBOB	6,838	1,714	Many incorrect military serial numbers and social security numbers. Various sources of unverified data used. No quality control of data entries.
REDWING	1,581	5,108	Almost all Air Force and Army data were missing.
UPSHOT-KNOTHOLE	3,201	10,775	All access lists and DESERT ROCK data were missing and unknown at the time the Army produced the lists. Therefore, the number given was based on the best guess.
Total	**14,854**	**28,215**	

Source: Defense Nuclear Agency.

The 1989 list of test participants was developed by Jaycor Corporation, a Defense Nuclear Agency (DNA) contractor. The figures provided above for those personnel inaccurately included in the test and those not included in the 1983 list were based on a comparison of the 1983 list used by the National Academy of Sciences and Jaycor's 1989 list. The criteria used to determine a match were an exact match of the individuals' first and last names and a match of any one of up to four military service numbers that an individual may have been given. A more detailed comparison could result in different figures.

Chronology of Events

1946-62	The former Atomic Energy Commission conducted more than 200 atmospheric tests of nuclear weapons in the United States and in the Atlantic and Pacific Oceans involving about 213,000 Department of Defense (DOD) military and civilian personnel.
1977	DOD personnel began a program to identify all DOD participants in the atmospheric nuclear tests to determine the extent of the participants' exposure to ionizing radiation. Each service branch was responsible for identifying its participants at each nuclear test.
Jan. 1978	The Defense Nuclear Agency (DNA) was designated as the DOD executive agency for all matters pertaining to the participation of DOD personnel in the atmospheric nuclear weapons test program. Among other things, DNA was tasked with (1) developing a history of every atmospheric nuclear event that involved DOD personnel; (2) identifying the radiation-monitoring control policies, procedures, and requirements that were in effect; (3) assembling a census of personnel at each event and identifying their location movements, protection, and radiation dose exposure; and (4) making this information available for scientific review and appraisal.
1979	Dr. Glynn Caldwell of the Centers for Disease Control (CDC) completed a report that noted an apparent increase in leukemia among DOD personnel who had participated at test shot SMOKY at the Nevada Test Site in 1957. The report generated much concern that the health of such participants might have been adversely affected by the test. Shortly after publication of the CDC report, DNA requested the National Academy of Sciences—specifically, the Medical Follow-up Agency (MFUA) of the National Research Council—to determine whether participants in SMOKY or other nuclear tests were at a higher than normal risk of death from leukemia or other cancers. MFUA agreed to undertake a mortality study, by cause of death, on a cohort of over 47,000 participants in five test series. DNA and the Department of Energy funded the study.

(continued)

May 1985	MFUA reported the results of its mortality study. The study confirmed an excess of leukemia among the SMOKY group of veterans and found a slightly increased number of prostate cancers among another group. Overall, MFUA found no consistent evidence of increased deaths from cancer or other diseases. MFUA found that the mortality from cancer in all groups of participants was less than the number of deaths expected among the general population, and mortality from other diseases was much less than expected.
June 7, 1985	Upon the study's release, DNA sent information on the results of the study to about 45,000 participants in the nuclear weapons tests. In addition, copies of the study were sent to about 600 institutions including all Veterans Affairs regional office libraries, all state libraries, and other libraries located in large cities. Subsequently, DNA has responded to thousands of inquiries concerning the nuclear atmospheric testing program. However, DNA does not have a system to identify either the persons or organizations making inquiries or those who may have received either a copy of the study or information on it.
Oct. 1987	DNA assumed responsibility for consolidating and refining the respective military services' participant data bases.
July 1989	After consolidating and refining the participant data bases, DNA's Nuclear Test Personnel Review (NTPR) Office compared its new list with that used by the National Academy of Sciences in the Academy's 1985 mortality study. As a result, NTPR found that about 15,000 of the 47,435 individuals thought to have participated in the five test series studied were not at the test shots. Also, NTPR identified over 28,000 other individuals who were present but not included in the study.
Aug. 30, 1989	DNA requested that the National Academy of Sciences revise or redo its 1985 mortality study because of the inaccuracies in the participant data cited above.
Apr. 13, 1990	The National Academy of Sciences proposed a 4-year study, estimated to cost about $2.5 million and to begin in January 1991. Between August 30, 1989, and April 1990, the Academy's researchers were doing pilot records work at the National Personnel Records Center, located in St. Louis, Missouri, to determine whether they could construct a control cohort group. This information was used to develop a cost estimate for redoing the 1985 mortality study.

(continued)

June 11, 1990	DNA's NTPR office recommended acceptance of the National Academy of Sciences' proposal, subject to the availability of funding. Between June and December 1990, DNA was waiting for the money to fund the study. From January to March 1991, DNA was processing the paperwork and obtaining the necessary approvals to perform the study.
Mar. 1, 1991	The DNA Contract Review Board met to discuss a proposed sole-source contract. The rationale for the sole-source contract was discussed in detail, and questions were raised as to whether the National Academy of Sciences was the only prestigious, internationally accepted authority capable of conducting this study. The Academy's policy not to involve itself in formal competition for government contracts was also discussed.
Mar. 6, 1991	DNA issued a request for competitive proposals (DNA001- 91-R-0035) to reexamine the mortality from malignant tumors, other diseases, and trauma of military participants of the same five atmospheric nuclear test series covered by the MFUA 1985 mortality study. The proposals were due by April 23, 1991.
Mar. 13, 1991	The National Academy of Sciences notified DNA that, although interested in performing the study, the Academy would not be submitting a bid because its policy was not to compete for open announcements.
Apr. 23, 1991	Closing date for submitting proposals. The Oak Ridge Associated Universities (ORAU) submitted the only bid.
Apr. 25, 1991	DNA's Source Selection Evaluation Board (SSEB) received its charge to evaluate the ORAU bid proposal.
June 26, 1991	The National Academy of Sciences asked DNA whether it intended to contract with the Academy to do the study.
July 29, 1991	SSEB's report was completed. The report recommended rejecting the ORAU proposal.
Aug. 7, 1991	DNA responded to the June 26 National Academy of Sciences' letter by stating that, because there were other possible alternatives in conducting a follow-up study, DNA was uncertain of the best way to proceed. However, DNA invited the Academy to submit an updated proposal exploring various alternatives for performing the study.

(continued)

Aug. 27, 1991	DNA informed ORAU that it was canceling its request for proposal (DNA001-91-R-0035) because of the unacceptable technical proposal submitted by ORAU.
Sept. 16, 1991	ORAU protested the cancellation to GAO, charging that the solicitation was tainted by DNA's presolicitation bias in favor of sole-source procurement with the National Academy of Sciences. ORAU stated that the solicitation of bids as a "fast track" procurement was a sham conducted for the single purpose of actually foreclosing competition in order to sole-source the procurement with the Academy.
Nov. 5, 1991	DNA officials indicated to GAO that they could do nothing about moving forward with a mortality study until the ORAU bid protest was settled.
Jan. 16, 1992	GAO denied the ORAU bid protest.
Jan. 24, 1992	DNA began preparing the paperwork to obtain a sole-source contract with the National Academy of Sciences.
Mar. 19, 1992	DNA requested that the National Academy of Sciences propose a study to update the 1985 mortality study. The study is expected to take 5 years to complete.
June 30, 1992	DNA officials said that the agency expects to award a contract by the end of July 1992 to the National Academy of Sciences to update the Academy's 1985 mortality study at a cost of $3.6 million.

Articles Citing the 1985 Mortality Report

The following six citations of the 1985 National Academy of Sciences Mortality Study were found in the data base called the Science Citation Index.

Bross, I.D. and N.S. Bross. "Do Atomic Veterans Have Excess Cancer? New Results Correcting for the Healthy Soldier Bias," American Journal of Epidemiology, Vol. 126, No. 6, (1987), pp. 1042-1050.

Darby, S.C., et al. "A Summary of Mortality and Incidence of Cancer in Men, From the United Kingdom Who Participated in the United Kingdom's Atmospheric Nuclear-Weapon Tests and Experimental Programs," British Medical Journal, Vol. 296, No. 6618, (1988), pp. 332-338.

Jablon, S. "Do Atomic Veterans Have Excess Cancer? New Results Correcting for the Healthy Soldier Bias," American Journal of Epidemiology, Vol. 126, No. 6, (1987), p. 1214.

Ketchum, L.E. "Epidemiologic Tables Lay Groundwork for Future Radiogenic Cancer Claims," Journal of Nuclear Medicine, Vol. 26, No. 9, (1985), pp. 967-972.

Weinberg, J.B. "Sequential Development of Polycythemia-Vera and Chronic Myelocytic-Leukemia in a Patient Following Radiation Exposure From Nuclear-Weapons Tests," American Journal of Medicine, Vol. 87, No. 1, (1989), pp. 121-123.

Yalow, R.S. "Is Radiation Less Harmful Than BEIR V Reports?" Physics Today, Vol. 44, No. 12 (Dec. 1991), pp. 13 and 14.

Comments From the National Academy of Sciences

INSTITUTE OF MEDICINE
NATIONAL ACADEMY OF SCIENCES
2101 CONSTITUTION AVENUE WASHINGTON, D C 20418

July 3, 1992

Mr. James Noel
Assistant Director
Resources, Community, and Economic
Development Division
United States General Accounting
Office
Washington, DC 20548

Dear Mr. Noel:

As mentioned in my conversation on June 29th, the Institute of Medicine has received and reviewed the proposal report entitled "Nuclear Health and Safety: Mortality Study of Atmospheric Nuclear Test Participants is Flawed" (GAO/RCED-92-182). We appreciate being given the opportunity; we have no comments to make on this report.

Sincerely,

Enriqueta C. Bond, Ph.D.
Executive Officer

Comments From the Department of Defense

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

WASHINGTON, DC 20301-3010

10 JUL 1992

Mr. J. Dexter Peach
Assistant Comptroller General
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "NUCLEAR HEALTH AND SAFETY: Mortality Study of Atmospheric Nuclear Test Participants Is Flawed," dated June 24, 1992 (GAO Code 302021), OSD Case 9070. The Department generally agrees with the report findings and the recommendation.

Detailed DoD comments in response to the recommendation are provided in the enclosure. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

Victor H. Reis

Enclosure

GAO DRAFT REPORT -- DATED JUNE 24, 1992
(GAO CODE 302021) OSD CASE 9070

"NUCLEAR HEALTH AND SAFETY: MORTALITY STUDY OF ATMOSPHERIC NUCLEAR TEST PARTICIPANTS IS FLAWED"

DEPARTMENT OF DEFENSE COMMENTS

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- RECOMMENDATION: The GAO recommended the Secretary of Defense require the Director, Defense Nuclear Agency, to notify veteran groups, researchers and the general public that the conclusions reached in the 1985 National Academy of Sciences' mortality study may not be valid because of inaccuracies found in the participant data used in performing the study and that the study is being redone. (p. 16 / GAO Draft Report)

DOD RESPONSE: Concur. The Director, Defense Nuclear Agency, will notify the approximately 700 institutions and the Department of Veterans' Affairs Regional Offices, which previously received copies of the study, and the Veterans' Service Organizations (and through them their constituent veterans) of the limitations in the 1985 Mortality Study and the update to that report. These avenues have proven effective in providing information to veterans and interested parties in the past. The Defense Nuclear Agency expects to complete these actions by September 30, 1992.

Scope and Methodology

To address the questions of the Chairman, Senate Committee on Veterans' Affairs, we interviewed officials from the Department of Veterans Affairs, Department of Energy, National Academy of Sciences, DNA, NTPR, CDC, National Council on Radiation Protection and Measurements, and the Jaycor Corporation (the DNA contractor involved with consolidating the various military test participant data bases). In addition, we reviewed the 1985 National Academy of Sciences' study and obtained documents and decision papers relating to the Academy's proposal for redoing its 1985 mortality study, the DNA rationale for competitively bidding the redoing of the 1985 mortality study, the subsequent bid protest, and DNA's rationale for continuing to provide information on the mortality study's conclusions after it became known that the 1985 mortality study's data base was flawed. We also coordinated our work with the Congressional Office of Technology Assessment (OTA) and reviewed six journal letters or articles identified by OTA through the Science Citation Index in which the Academy's 1985 mortality study was cited.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.

James E. Wells, Jr., Associate Director
James Noel, Assistant Director
Edward E. Young, Jr., Assignment Manager
Frederick A. Harter, Evaluator-in-Charge

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