

**EFFECTS TO VETERANS OF EXPOSURE TO IONIZ-  
ING RADIATION, SUBSEQUENT TREATMENT,  
AND COMPENSATION**

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**HEARING**  
BEFORE THE  
SUBCOMMITTEE ON  
COMPENSATION, PENSION, INSURANCE AND  
MEMORIAL AFFAIRS  
OF THE  
COMMITTEE ON VETERANS' AFFAIRS  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED FOURTH CONGRESS  
SECOND SESSION

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# EFFECTS TO VETERANS OF EXPOSURE TO IONIZING RADIATION, SUBSEQUENT TREATMENT, AND COMPENSATION

TUESDAY, APRIL 30, 1996

HOUSE OF REPRESENTATIVES  
SUBCOMMITTEE ON COMPENSATION, PENSION,  
INSURANCE, AND MEMORIAL AFFAIRS,  
COMMITTEE ON VETERANS AFFAIRS,  
*Washington, DC.*

The subcommittee met, pursuant to call, at 9:30 a.m., in room 334, Cannon House Office Building, Hon. Terry Everett (chairman of the subcommittee) presiding.

Present: Representatives Everett, Clement, Kennedy, Barr, Montgomery, Evans, Weller, Hayworth and Ney.

## OPENING STATEMENT OF CHAIRMAN EVERETT

Mr. EVERETT. Good morning. The subcommittee will come to order. We are here today to receive testimony regarding the performance of the VA's compensation program for those exposed to ionizing radiation.

A look at the numbers presents some disturbing facts. Only about 10 percent of those applying for radiation-compensation have been approved. Possibly that is why VA's written testimony was so short of facts. I hope Mr. Vogel and other Government witnesses will be able to further inform us of what is actually going on and offer some explanation as to why so few radiation claims are allowed.

I do realize this is a complex subject and there is significant disagreement within the scientific community as to the dangers associated with exposure to radiation. But that is no excuse for inaction on the part of the Government and I hope to hear some ways to improve the situation.

I am particularly disturbed by the cases DAV cited, which appear to portray an overly frugal VA when it comes to radiation-related compensation. I would also note that the process to get compensation in this area is much more convoluted than for other claims.

Before we begin, I'd like to recognize the very distinguished ranking member of the subcommittee, Lane Evans, for any remarks he may have.

## OPENING STATEMENT OF HON. LANE EVANS

Mr. EVANS. Thank you, Mr. Chairman. I appreciate you holding this hearing as the son of an atomic veteran. It's a very important

issue and I look forward to hearing from our witnesses as well to explore what the Department of Veterans Affairs and the subcommittee can do in the future to see that their sacrifices and needs are recognized.

There can be no question that atomic veterans were not adequately informed of the dangers of ionizing radiation and may have been injured as a result. Many of these men and women have paid for their dedication invariably with their health and some with their lives. We owe it to them to see that they're not forgotten and that they receive compensation and the care that they deserve.

This hearing is a small, but important step, insuring that we fulfill our duty to them. Central to our work today will be the recommendations of the Advisory Committee on Human Radiation Experiments. While most of the report focused on experimentation on civilians, the recommendations contained in the report concerning atomic veterans are an indictment of how our Government and the Republican and Democratic Administrations have failed these veterans.

The recommendations of the committee mirror many of the concerns that atomic veterans have had for years. The list of presenting disabilities contained in the law is inadequate and the standard of proof to meet administrative claims is often impossible to meet and that these statutes are limited and inequitable in their coverage.

I look forward to hearing from Dr. Faden today on her committee's work. I also know that the VA's human radiation interagency working group has convened a meeting to come up with a response to the Advisory Committee's recommendations. I hope through this hearing we get an idea of what they are, where they are in the process, and urge them to fully adopt these recommendations.

In the meantime, Congress must provide the leadership to make sure these veterans' needs are met. In the near future, I will be introducing my own legislation based on the precedent sent by Marshall Islands Nuclear Claims Tribunal Act, which will provide additional presumptive diseases for atomic veterans. Currently, Marshall Islanders receive compensation if they exhibit one or more of the 27 illnesses presumed radiogenic in nature. My legislation would ensure that all of the radiogenic illnesses that the Marshall Islanders are compensated for are also on the presumptive list for our Nation's veterans. This is the least we can do to make sure that they receive compensation for illnesses already determined by our Government to be linked to exposure to ionizing radiation. Today's hearing should only reinforce the need for this legislation.

Again, thank you, Mr. Chairman, for holding this important hearing. I look forward to working with you on this issue. Thank you very much.

Mr. EVERETT. Thank you, Lane. Bob, do you have any opening remarks?

#### OPENING STATEMENT OF HON. BOB CLEMENT

Mr. CLEMENT. Very briefly. Thank you, Mr. Chairman. These hearings are very, very important and being a veteran myself, we must focus our efforts on their health and welfare, and particularly on those veterans in this hearing that have been exposed to radi-

ation during their active military service, the so-called atomic veterans. It's good to be here and part of these hearings. I hope something comes about that we can better understand what these veterans have suffered with over the years.

Mr. EVERETT. Thank you, Bob. Our first panel consists of Ms. Carol Rutherford from the American Legion and Mr. Joe Violante from the Disabled American Veterans. I'd like to compliment both of you for your extensive and complete testimony. You may begin, please.

**STATEMENTS OF CAROL RUTHERFORD, ASSISTANT DIRECTOR FOR INFORMATION MANAGEMENT, THE AMERICAN LEGION AND JOSEPH A. VIOLANTE, LEGISLATIVE COUNSEL, DISABLED AMERICAN VETERANS**

**STATEMENT OF CAROL RUTHERFORD**

Ms. RUTHERFORD. Mr. Chairman, members of the subcommittee, before I begin, I'd like to express Mr. Wilkerson's regrets at not being able to present testimony to you today in person.

The topic before the subcommittee, as you know, is important to the American Legion and we appreciate the opportunity to present our views on issues relating to the health and welfare of these veterans exposed to ionizing radiation during their active military service.

Through the years, the American Legion has supported scientific research and legislation intended to be sure that veterans who were exposed to radiation in the service receive adequate compensation for often fatal diseases related to their exposure.

Since early 1994, VA has continued its review of and search for radiation records through the President's Advisory Committee on Human Radiation Experiments. The final report released last fall contains several recommendations to President Clinton's inter-agency working group which we strongly support. Recommendations 5 and 6 under the topic biomedical experiments and population exposure are of special interest.

Recommendation 5 focuses on problems of radiation exposure at the Hanburg Nuclear Reservation in Washington State during the years 1933 to 1962 and the need for an amendment to the Radiation Compensation Act of 1990 to cover individuals who may have been exposed to radiation in the area of that facility.

The American Legion believes such legislative action should extend eligibility under this program to both active duty personnel stationed at Hanburg since 1943 and members of the civilian communities in that area. In addition, we strongly believe that the definition of radiation risk activity found in 38 United States Code should be amended to include individuals who performed active duty at other facilities and activities such as Hanburg.

Recommendation 6 points out a number of standing concerns that we agree should be addressed, including number one, the condition and maintenance of adequate records regarding the identity, test locales and exposures of all test participants. No. 2, upgrading the list of presumptive diseases. No. 3, review of the standard of proof of veterans without a presumptive disease. No. 4, improving the timeliness of radiation claims. 5, reconsidering and possibly re-

allocating funds and time spent on contractors and consultants in the administering of the program. And 6, review of statutes which are limited and inequitable in their coverage.

We will be watching with great interest the response of the Interagency Working Group to the Advisory Committee report.

Mr. Chairman, the road to change has been and will be bumpy, but we do not want to give the impression that we are unaware of the VA's efforts to improve services to atomic veterans. This includes recent additions to the list of presumptive radiogenic diseases and amending 38 CFR 2.311 which held that the list of radiogenic diseases was not an exclusive list of conditions that could be recognized as service connected based on exposure to ionizing radiation.

We are also given to understand that the Department of Veterans' Affairs is reviewing possible legislation to allow veterans who were treated with nasal pharyngeal radium in service to participate in the VA's ionizing radiation registry program and to receive priority medical care.

The VA is also planning to increase position education on issues related to nasal pharyngeal radium treatment along with a possible screening program.

In summary, even though we feel recent VA efforts to care for veterans are laudable, we also feel there is a continuing need for research and an obligation to address the progressing problems facing atomic veterans and their dependents. We believe the VA needs to consider the expeditious development of new regulations and guidelines that will enable these veterans and their families to have their claims fully and fairly considered.

Mr. Chairman, this concludes my statement.

[The prepared statement of The American Legion appears on p. 31.]

Mr. EVERETT. Thank you very much. Joe.

#### STATEMENT OF JOSEPH A. VIOLANTE

Mr. VIOLANTE. Thank you, Mr. Chairman, members of the subcommittee. On behalf of the DAV and its auxiliary, I wish to thank you for this opportunity to present our views today regarding the controversy surrounding the VA medical treatment and disability compensation for so-called atomic veterans.

The remedial legislation passed by Congress over the years has not had a desired effect and must be revisited in order to provide meaningful health care and disability compensation for this group of veterans. On top of the problems particular to radiation diseases, atomic veterans experience the same frustrations as all other veterans who attempt to access the VA health care system, a system inadequate to meet veterans' medical needs and their demands for services.

This crisis is the result of years of inadequate funding and a patchwork approach to addressing the health care needs of veterans. On paper, VA health care provisions regarding atomic veterans appear to provide access to medical care. Yet, atomic veterans and their families believe otherwise. Congressional oversight is therefore in order to ensure that atomic veterans are receiving adequate quality health care treatment.

Receiving disability compensation from the VA is another frustrating aspect of the ionizing radiation debate. All too often atomic veterans and their survivors are denied compensation from our Government for the residual illness, disease or disability or death allegedly associated with exposure to ionizing radiation which others, such as the Marshall Islanders, receive compensation from our Government for the same disability.

Presently, the VA recognizes 20 diseases as radiogenic under 38 CFR 3.311. This section was designed to assist atomic veterans and their survivors in obtaining compensation for disability and death due to exposure to ionizing radiation. However, very few atomic veterans or their survivors benefit from this provision.

The *Combee* case, discussed in my written testimony, is not an exception to the rule, but is representative of the vast majority of these types of cases. Like so many other veterans, Mr. Combee succumbed to this disabilities before his claim could be properly adjudicated on the merits. It cannot be overemphasized that radiation claims are wrongfully denied because of inaccurate reconstructive dose estimates used as the basis for determination that service connection is not warranted. An example of such a case is that of diseased atomic veteran, Michael Stanko, who died in 1985. Although his claim had been denied in part due to minimal exposure to ionizing radiation, post mortem plutonium studies showed that he had 98 rem bone dose, 33 rem lung dose and 7.5 rem ingested dose. Adjudication of radiation claims pursuant to Section 3.311 have been a failure with almost 95 percent of atomic veterans unable to establish service connection for their disabilities.

The list of presumptive diseases doesn't include all 20 that are recognized by the VA as radiogenic diseases. Further, as pointed out by Congressman Evans, the Marshall Islanders receive additional disabilities for compensation purposes. At the very least, America's atomic veterans should receive a rebuttable presumption for all diseases, illnesses or disabilities for which others are compensated.

Something is seriously wrong with this process if atomic veterans such as Mr. Combee and Mr. Stanko are continuously denied service connection for residuals of radiation exposure when the evidence clearly warrants allowance in those cases.

While we note that these new benefits would come under the Pay-go provisions of the Budget Enforcement Act, it appalls us to think that in order to pay compensation for this new legislation, some other worthy group of wartime disabled veterans or their dependents would have to give up their compensation to fund this new legislation to benefit atomic veterans also a worthy and deserving group.

Congress must realize that paying for disability of wartime disabled veterans is nothing more than an extension of the costs of war by our Government. Pay-go provisions should not apply to benefit for services affecting wartime disabled veterans.

This concludes my statement and I'd be happy to answer any questions.

[The prepared statement of Mr. Violante appears on p. 36.]

Mr. EVERETT. Thank you. I appreciate that. As you pointed out in the case of Mr. Stanko, that began at VA 17 years ago.

Mr. VIOLANTE. Yes. That included his wife's claim for death benefits.

Mr. EVERETT. Each of you pointed out that you feel the adjudication process is less than adequate. What changes would you suggest?

Mr. VIOLANTE. First of all, I would make all radiogenic diseases presumptive which would thereby give the veterans the benefit of not having to have these dose reconstructed estimates because as far as I can tell, they're far from adequate in reflecting their actual exposure.

There are number of veterans that I've talked to that have talked about swimming in the lagoons and eating the fruits that they found on the island shortly after the tests were detonated and there's no way to account for their total exposure.

If Congress was to continue to legislate under 3.311, I would certainly like to see something done with regards to the dose estimates to give these veterans a fighting chance in proving service connection.

Mr. EVERETT. A lot of the military records are no longer available.

Mr. VIOLANTE. That's correct. And that's why if there was a presumption it eliminates having to show that there was a specific exposure level.

Mr. EVERETT. Should VA consolidate its radiation claims processing?

Mr. VIOLANTE. Only if it will benefit veterans. Consolidation in certain cases has proved beneficial because it provides an expertise in those people. As long as there are no mindsets that would prevent the proper service connection of these disabilities, I think that consolidation might be beneficial.

Mr. EVERETT. Should VA begin enlarging the radiation registers to include those now on active duty in radiation-related jobs such as propulsion systems in weapons programs?

Mr. VIOLANTE. I would have to agree with that. It should be expanded to include those people.

Mr. EVERETT. Thank you very much. Lane.

Mr. EVANS. Thank you, Mr. Chairman. Let me ask you both, Joe, you mentioned in your statement that dose reconstruction estimates prepared by DNA are inaccurate.

Do you believe we're better off trying to better dose reconstructions or describing them entirely?

Mr. VIOLANTE. That's hard to say based on my limited knowledge. I don't know how accurate we could get them. A lot of the people did not wear badges. I don't know if our Government would even be willing to come forth with a true estimate of what these veterans were exposed to, so I would have to say that I would like to see that scrapped totally.

Mr. EVANS. Thank you.

Ms. RUTHERFORD. Yes, I think I agree with that to an extent, but I really think we have to agree with the findings of recommendation 6 that it should at least be reviewed and looked at, at the epidemiological tables should be looked at.

Mr. EVANS. But both of you agree that we should raise the number of presumptive illnesses to the 27 that are allotted to the Marshall Islanders?

Mr. VIOLANTE. Wholeheartedly.

Ms. RUTHERFORD. Yes sir.

Mr. EVANS. Joe, you talked about a perception, at least of VA health care being inadequate for these veterans. Could you give us some specific commendations that we might take to improve health care for atomic veterans?

Mr. VIOLANTE. Recommendations. The people that I've talked to seem to be concerned about who they're actually seeing. They don't believe that the physicians that they're seeing have sufficient expertise with these type of disabilities to adequately diagnose them. So one thing would be to ensure that the physicians they are seeing have some type of background in diseases associated with radiation exposure so that they can adequately diagnose these disabilities.

I mean something needs to be done. These people just don't feel they're receiving the proper care and not having a medical background, it's difficult for me to say how to adequately do that, but something certainly needs to be done.

Mr. EVANS. So we're not only experiencing the same kind of problems other veterans are facing, they're feeling that they're not meeting experts in their respective, in the area of atomic veterans and ionizing radiation?

Mr. VIOLANTE. Exactly, and some of these veterans have indicated that they feel that these physicians, in order not to encourage claims, diagnose nonradiogenic type diseases such as psychiatric disability or irritable bowel syndrome, just—and again, I have no personal experience, only people that I've talked to and so I don't know if those are true or not, but I certainly think that based on the conversations that I've had that it should be further looked at.

Mr. EVANS. Thank you, Mr. Chairman.

Mr. EVERETT. Mr. Clement.

Mr. CLEMENT. Joe, you mentioned that most reconstruction estimates prepared by DNA are inaccurate. How could a review of DNA's estimates lead to more accurate estimates in the future?

Mr. VIOLANTE. I think number one that all the records involved during those tests should be reviewed by an independent agency. I've seen records that would seem to indicate that those estimates were low at the time and if there were some accurate records kept or some information that would help to provide some accuracy to those reconstructive estimates, I'd certainly like to see those records made available.

Mr. CLEMENT. For either one of you, the Secretary of Veterans Affairs is working with DOT, DOD and HHS in formulating a response to the recent recommendations to review all of the laws and regulations intended to provide benefits to atomic veterans. This is in response, as you know, to a recommendation by the President's Advisory Committee on Human Radiation Experiments.

Do you feel that veterans' service organizations concerns can or will be addressed by this working group?

Mr. VIOLANTE. I believe we'll certainly have some input into that, yes.

Ms. RUTHERFORD. It appears from what we've heard, I have to agree.

Mr. CLEMENT. One of the most significant and controversial subjects covered by ACRE or A-C-R-E, was the protection of human subjects in any kind of biomedical research. While the Advisory Committee did not conclude that exposure of veterans to low doses of radiation constituted such research, there are serious implications for service members exposed to potentially dangerous substances. For instance, should service members be informed before being deployed in the Persian Gulf theater of operations that the nerve agent pre-treatment they were offered might have side effects?

Mr. VIOLANTE. I think certainly any human being deserves to be informed of what they're experiencing in some situations. Particularly in war time, I know it becomes a little bit difficult, but certainly if the Government is aware of some side effects I think people should be informed, however, the Government also has to balance whether or not these men are going to be exposed to certain diseases or illnesses for which these inoculations and other things are necessary, so there's a balancing there. I certainly would favor having them informed.

Mr. CLEMENT. Was this a medical experiment or was it an expedient measure designed to save lives, do you believe?

Mr. VIOLANTE. I can't answer that, that question is certainly valid.

Mr. CLEMENT. Is maintaining a registry of subjects sufficient to protect service members from unanticipated health effects?

Mr. VIOLANTE. I think it certainly helps.

Mr. CLEMENT. Ms. Rutherford, do you want to comment on any of those?

Ms. RUTHERFORD. He is doing so well. I have to agree with him, yes sir.

Mr. CLEMENT. Thank you.

Mr. EVERETT. I want to thank the panel for their testimony and tell you that I would guarantee you that the members of this committee would agree to the statement in your written testimony and I quote, "Why does the Government continue to put the needs of veterans behind those of other groups such as the Marshall Islanders? American servicemen should always be considered a unique special group for having served their Nation with honor."

Thank you very much for your testimony here today.

Our next panel includes Mrs. Broudy from the National Association of Atomic Veterans; Mr. Tom Smith, National Association of Radiation Survivors; and Mr. Acie Byrd from the Alliance of Atomic Veterans.

**STATEMENTS OF PAT BROUDY, LEGISLATIVE DIRECTOR, NATIONAL ASSOCIATION OF ATOMIC VETERANS; TOM SMITH, LEGISLATIVE DIRECTOR, NATIONAL ASSOCIATION OF RADIATION SURVIVORS; AND ACIE BYRD, JR., ALLIANCE FOR ATOMIC VETERANS**

**STATEMENT OF PAT BROUDY**

Ms. BROUDY. My name is Pat Broudy. I am the Legislative Director for the National Association of Atomic Veterans. I'd like to start this off with just a comment that this small speech will be in the form of questions that we desire to have answered by the various agencies involved in the affairs of atomic veterans and their survivors.

(1) The Defense Nuclear Agency answers to an Under Secretary of the Department of Defense. An impressive number of past and current top officials of DOD also are alleged members of the board of Directors of Science Applications International Corporation, including the current Secretary of Defense and the previous nominee.

Is it not a conflict of interest for SAIC to have those dose reconstruction contracts with DNA when DNA is influenced by previous and current DOD superiors who are or were SAIC Board Members?

(2) Radiation exposure amounts used by VA to judge biological effects on atomic veterans and probability that radiation exposures caused their diseases have considerable basis in studies of Japanese survivors of the Hiroshima and Nagasaki atomic bombings. Japanese near Ground Zero largely received lethal doses of radiation were killed by blast, or were burned to death in the fire storms that followed. Their radiation doses primarily were from external neutron and gamma radiation and they certainly were not in trenches during the detonations.

Atomic veterans on the other hand, were in trenches and not killed by blast or fire, but marched to or visited damaged equipment displays within a few hundred meters of Ground Zero at a time when respirable-sized radioactive particles were suspended in the air they breathed. These veterans were exposed to less external radiation than some Japanese, but much higher internal doses, particularly to the lung and lymph nodes and from previous shot fission products and plutonium as well as new fission and activation products.

Why has not DOD or VA done in-depth studies of these internal exposures instead of relying on inappropriate Japanese data?

(3) In the same sense as the last question, much has been written about where chemically soluble radioactive particles go after entering the body, maximum amounts of various radionuclides tolerable in various body organs, and doses received by those organs from the radioactive material reaching them.

Little has been written, however, about the kinds of radiation doses received internally by atomic veterans from inhaling and ingesting old and new fission products, activation products and plutonium. These radionuclides primarily are oxides and are relatively insoluble. They do not quickly go to the bone, as VA and its sources assume, and do most of their immediate and future damage to the lungs and lymph nodes.

SAIC based an internal dose screen for determining those military units not eligible for individual dose reconstructions, on a minimum dose to bone. This screen eliminated most atomic veterans of continental tests from obtaining internal dose reconstructions.

Why, knowing full well the hard bone essentially is immune to cancer from radiation as early as 1972 and certainly by 1980, did SAIC develop and publish this screen in 1985?

Why did DNA authorize and pass on this fraudulent information to the VA and why then did the VA use this information to avoid assigning internal doses to atomic veterans and deprive their survivors of compensation provided by law?

(4) Again, in the same sense as the previous two questions. Atomic veterans did receive very large doses to the lungs and lymph nodes. For example, short half-life activation products have very high radioactivity, do most of their damage in a few days after the shot and do not have time to go beyond the lung and lymph nodes.

Another example is plutonium 239 oxide, which primarily stays in the lungs and lymph nodes and does not go to the bone for a long time, if at all.

Public Law 101-426 as amended by Public Law 101-510 specifies that uranium miners be compensated for certain nonradiogenic diseases associated with the lungs, as well as lung cancer, after being exposed internally to radon and its radioactive daughter products in the lung.

Why should not atomic veterans be compensated for these same diseases for inhaling the large amount of radioactive materials previously described?

Are not atomic veterans the same species of human beings as uranium miners?

Thank you.

Mr. EVERETT. Thank you very much. Whichever order you choose to go in is fine.

[The prepared statement of Ms. Broudy, with attachments, appears on p. 44.]

#### STATEMENT OF TOM SMITH

Mr. SMITH. Good morning. My name is Tom Smith and I'm the National Association of Radiation Survivors legislative advocate in Washington. The National Association of Radiation Survivors welcomes this opportunity to comment directly to the House of Veterans Affairs Subcommittee on both proposed legislation by representative Lane Evans, and a report from an advisory committee on radiation experimentation.

We, of course, are supportive of the additional list of diseases in the Evans Bill as we have atomic veterans who will directly benefit from these changes in the presumptive list.

Obviously, we would prefer other kinds of illnesses added to the presumptive list, skin cancer, and lung cancer are particularly common among the survivors.

Skin cancer is one example. The DVA attempts to portray most skin cancers as induced by continued exposure to the sun, yet there's contrary evidence as reported in the BEIR V Report. It is

just as likely as not that without the radiation exposure these men would not have developed skin cancer.

Then there is the example of a class of diseases that we would normally expect to find in older persons, but that in the atomic veteran began appearing in their middle ages. These include cardiovascular, neurological diseases, bone and muscle deterioration, arthritis, sterility, hyper and hypothyroid diseases. There are also many autoimmune illnesses such as diabetes, systemic lupus, pernicious anemia and connective tissue disorders.

I fall into that particular group of atomic veterans prematurely suffering from some of the above mentioned illnesses. I was aboard the *S.S. Hooper Island* in Enawetok and witnessed 17 detonations during Operation Hardtack. The detonations I witnessed were of varying distances; some closer than others, some above ground, some at ground level and one under water. I was close enough to feel the heat flash and hot enough that I felt my clothes were going to set on fire; loud enough that when the shock waves hit the ship the impact of was hard enough that if it had been a building, it would have collapsed.

For many years after my exposure to atomic detonations I experienced health problems that no one in my family had ever experienced, and no one in the medical community could explain, problems that doctors just couldn't come up with solutions for.

It was not until years later that I discovered there were other people, veterans, downwinders, people who worked in the uranium mines and the Japanese Hibakusha, people from all over the world and all walks of life having similar health problems as myself with one common factor. We were either exposed to radiation by working with it or having been exposed to the effects of a nuclear bomb.

I've had to endure over 25 operations and some extended hospital stays. I've had seven spinal operations with many bone grafts and fusions. The last operation I had on my spine was this past November. I've had reconstructive joint operations and surgery to remove tumors. I've had so many operations, that today I cannot remember then without consulting the medical records.

I have to contend daily with a suppressed immune system, diabetes, chronic liver disease, thyroid disorder and chronic pain. With all of this I am still considering myself one of the lucky ones. I am still here. I am alive. I'm here today speaking to you on behalf of my comrades and my shipmates that have died before their time as a result of radiation exposure.

Finally, we have a problem of genetic disorders in our second grandchildren and in our first children. We find it tragic that the National Academy of Sciences recently determined they could not perform a study of genetic effects. Money and the ability to obtain the proper cohorts were cited as factors in reaching this conclusion.

It continues to amaze survivors that the Executive and Legislative branches of the Government always seems to find money when the issue is of their concern, but somehow the lack of money is always cited when talking about the victims of the Government's negligence.

In reference to the Advisory Committee on radiation experimentation, we understand that the atomic veteran was not classified as a listed duty. There are a lot of people that believe that the expo-

sure to radiation in the service was a normal hazard; that the people who joined the service were taking that risk.

This risk, however, is accepted under the belief that physical harm may come from an enemy during a period of conflict, not from their own Government as experienced by atomic veterans, Agent Orange veterans and most recently, the Gulf War veterans. The Advisory Committee apparently struggled to define all of the human experiments.

In Chapter 10 of their report, they conceded the bomb tests were somewhat experimental is of course, correct. Tests of new and untried atomic weapons were, as noted by the Chief Health Officer of the Los Alamos Lab, fundamentally a large scale laboratory experiment. At the same time, although there was a real possibility that human subject research had been conducted in conjunction with the bomb tests, the tests were not experiments in bombing human subjects.

Finally, I would like to recommend the passing of Representative Evans' bill with the modifications to the presumptive list, and that the committee take the time read the Advisory Committee report, particularly as it pertains to the atomic veteran, then consult with the atomic veteran, objective scientists, DVA, the White House and whoever is appropriate, and end this issue once and for all by ensuring justice and restitution to those harmed; these courageous veterans and their families.

Thank you.

[The prepared statement of the National Association of Radiation Survivors appears on p. 80.]

Mr. EVERETT. Mr. Byrd.

#### STATEMENT OF ACIE BYRD, JR.

Mr. BYRD. Good morning, Chairman Everett and also the ranking Democratic member, Lane Evans. The three principal atomic veterans groups, the Alliance of Atomic Veterans, the Association of Atomic Veterans, the National Association of Radiation Survivors, on February 26, 1996 the three groups formulated a collective position that reflects our common concern regarding the medical conditions to the Nation's atomic veterans and the inadequate remedies by the United States Government thus far.

We had over three decades of discussion, pain and suffering and scientific research and legislative hearings, the body of principals and immediate proposals which we feel reflect the collective wisdom and experiences of the atomic veterans and their families in our great country.

We would like to respectfully submit the following two points for your review and deliberation. The Atomic Veteran Working Group recommendations are: (1) all radiation victims be compensated for the same radiogenic illness and in the same amount regardless of site or exposure and all such illnesses be presumptive. (2) That all classified service and medical records of atomic veterans be immediately declassified. (3) The radiation activities reviewed by the Veterans Task Committee on Environmental Hazards, August of 1993, be included in consideration of the existing law and in the future laws pertaining to atomic veterans without time constraints. (4) The radio-epidemiological tables be eliminated a source of reli-

ance by the VA in determining veterans' survivors entitlement to service connections. (5) We recommend that all persons covered under RICA be awarded the highest sum with no off-sets or restrictions. (6) After all of the radiogenic illnesses in PL 98.542 become presumptive and PL 98.542 be repealed in its entirety. That any illnesses determined by a competent physician to be radiogenic shall be added to the presumptive ill. (7) Survivors of atomic veterans who did not receive care in the military hospitals and clinics be awarded monetary sums excluded by them for the care, treatment and hospitalization and other expenses suffered by veterans' survivors in today's dollars. That all survivors receive compensation for loss of income and other expenses incurred as a result of the veterans' illness. If the veterans die with a disability listed in Public Laws 101-321 and 102-578 or any veterans' illness is found to be radiogenic in the future let the remuneration as suggested in the report of the Advisory Committee be issued to survivors' benefits and not public germane for offsets for Social Security benefits or other benefits received as a result of the veteran's illness. Prior to care, the hospitals must be on a continuous basis and not subject to yearly rules. (8) On-site presence of test sites will be used for compensation purposes in the absence of other illnesses to the contract. This is the important part I wanted to make today.

That a register be established from the offsprings of atomic veterans who may have developed genetic health problems as a result of his or her parents or grandparents' exposure to ionized radiation and compensation paid for their care.

Atomic veterans must be accorded positions on the Bioethics Committee and any future committees related to exposure to ionized radiation. There's a Bioethics Committee being established by the Executive Branch and we have formally requested to have a representative on board with them.

I'd just like to add, I think that it has been alleged that the Cold War is over but as one of my colleagues has pointed out, it seems to be dragging the foot in terms of really addressing these issues with respect to veterans. I think even though the Advisory Committee summarized some of the problems of the atomic veterans, they really didn't go into detail which I think they should have, but—so thank you very much.

[The prepared statement of Mr. Byrd appears on p. 87.]

Mr. EVERETT. I thank the panel for their testimony.

Mr. Smith, at the time you suffered your exposure from radiation, you and others, were you given any information or warnings of any possible problems, if you recall, of any dangers?

Mr. SMITH. Absolutely none, Mr. Chairman, with the exception I recall lecture I went to that everyone was required to go to that said if you got enough radiation to hurt you, it would kill you. Don't worry about being sterile because if you're sterile, you're going to be dead. And that was about the extent of the indoctrination. They were more concerned about the wildlife in the Marshall Islands, the sharks, stonefish, Portuguese man o' war and that kind of thing than they were about the radiation.

Mr. EVERETT. When did you personally become aware of, in your case, a relationship between your illnesses and radiation exposure?

Mr. SMITH. I never really put the two together for a long time. One of the things that stands out in my mind, my mother is still alive today and she was clearly obstinate about the fact that it was because I had gone to the atomic tests. She insisted that all of this was because of that. And I just kind of never really gave it much thought until one day I met with a group of veterans here in Washington from the National Association of Atomic Veterans. They were having a meeting here in Washington and I saw a notice about it and I went to see what it was about and what happened was I found out there were all kinds of other guys having the same problems that I was having at this meeting.

This was back in 1979. Now I got out of the Navy in 1958, so there was a large period of time there that I had no idea why I was getting all this illness and as I say, I consider myself lucky. I'm still here.

Mr. EVERETT. Thank you, Lane.

Mr. EVANS. Thank you, Mr. Chairman. Before going any further I'd like to recognize the distinguished Chairman of the National Security Committee and a member of this committee who has joined us, Congressman Smith.

Could each of you please outline your thoughts as to why you believe that those reconstructions performed by DNA are inadequate?

Ms. BROUDY. They're inadequate in that there really doesn't seem to be any way, positively, to do a reconstruction. If it's done the way the DNA has been doing it using the bone as a critical organ, they're not going to get very far with that because the bone, as I mentioned in my testimony, is not a type of internal organ that readily accepts the radiation and develops into a cancer.

The prime concern there is with the lung and the lymph nodes. So why are they inadequate? The day I left to come here to this meeting, I received a fax from DVA. We've been trying for years to get the numbers of awards that have been made under Public Law 98-542, since its inception in 1985. There are less than 50, I finally was able to squeeze out of the DVA after years of trying, less than 50.

In my written testimony, I think I stated that the NTPR program, and these are only partial costs, have cost the American taxpayer over \$113 million. Now if we have only 50 or less than 50, less than 50 can be anything between 1 and 50, the taxpayer is not getting a very good product for their effort. So my contention is, and it was mentioned by Acie, that if we would make all of the cancers considered radiogenic, make them presumptive, and after that repeal the entire law of 98-542, we could save millions. We don't need dose reconstructions and if some people are awarded benefits under the presumptive law and some people aren't because there are about 10 cancers that are on both lists, it doesn't make sense.

Mr. EVANS. Sorry to interrupt, but you said you received a fax from the DVA?

Ms. BROUDY. Yes, I got a fax the day I left.

Mr. EVANS. Do you have a copy of it?

Ms. BROUDY. Yes, I do and I'll be happy to give it to you.

Mr. EVANS. We would like to include that in the record, Mr. Chairman?

Mr. EVERETT. Without objection.

(See p. 59.)

Ms. BROUDY. I think I gave one to Tom yesterday.

Mr. EVANS. We'll insert it into the record.

Ms. BROUDY. All right. I have other documents that I would like to enter into the record.

Mr. EVERETT. Without objection.

Ms. BROUDY. Regarding this issue. The last count obtained for the numbers of awards made under 100-321 and 102-578, the presumptive laws, was 414, which do not require dose reconstructions.

Now that's out of about 18,000 claims by atomic veterans and widows, so what we are saying is 414 and maybe 50 adds up to less than 500 out of the over 200,000 servicemen who were exposed to radiation during the nuclear testing.

It doesn't seem to me that with the millions—we've done some investigation into this and have come up with the figure of half a billion dollars. I have gotten, and I provided it to Tom yesterday, figures from the DNA of what it has cost for the NTPR program since 1978 and also what it has cost for dose reconstruction. They both add up to \$113 million for "less than 50" awards under Public Law 98-542. But in addition to that I have sent FOIAs to DNA for all of the expenses, expenses of the contractors, the expenses of subcontractors. There are so many other expenses involved with this which are nothing but make-work laws, make-work items for people to keep their jobs with DNA and the DOD and the DOE.

Mr. EVANS. Mr. Chairman, if I could beg your indulgence for one moment.

Mr. EVERETT. Certainly.

Mr. EVANS. I know none of you believe that VA has done enough to investigate those effects in the offspring, the children of the atomic veterans. Could you, at least for the record, provide us, describe some of the illnesses that you found among your members' offspring?

Ms. BROUDY. From the written testimony that I presented to the committee, we list those on the last several pages. We have—and this is the first and second generation. We have seven spina bifidas but most of the others are malformations, cancers, I can't remember off the top of my head, but what I did find out when I was doing this investigation and this really, really upset me, I had a document received from the VA in which I found out that they had been keeping a registry of all of the atomic veterans who called in on the hotline. The veterans were examined, they had physical examinations. After the examination the physician filled in a form which is attached to that document. In the form, it states under No. 17, "Is there evidence of birth defects among veterans' children or grandchildren." I think that's extremely important in light of what Tom has said.

The National Academy of Sciences conducted a feasibility study that lasted for 6 months to determine whether it was feasible to do an epidemiological study and it was found that it wasn't feasible. They had those figures from the registry. They had them since 1986 and we didn't even know about them. I didn't know about it until recently, so what I'm saying is the VA has a registry of atomic veterans and their illnesses and their children and their

illnesses and that's really of prime concern to us because we have a very large number of kids that have some very strange problems.

Thanks for asking the question. I appreciate it.

Mr. EVANS. Thank you, Mr. Chairman.

Mr. BYRD. Mr. Chairman, can we submit other questions that were raised by the record?

Mr. EVERETT. Certainly, there will be other questions for the record. And if you would just submit those in a timely fashion, we would appreciate it.

Thank you panel, for your participation.

Mr. BYRD. The Task Force on Radiation and Human Rights, which all of us belong to, can I submit that for the record?

Mr. EVERETT. Certainly, any information you like can be submitted for the record. We'd be happy to have it.

(See p. 88.)

Mr. BYRD. Thank you.

Mr. EVERETT. Thank you and thank you again for your participation.

Ms. BROUDY. Thanks.

Mr. EVERETT. Did Dr. Faden make it here yet? No.

The next panel is composed of Mr. John Vogel, Under Secretary for Benefits and Joan Ma Pierre, Director of Electronics and Systems from Defense Nuclear Agency. I think it's important that they be able to respond to the previous witnesses and that's why I scheduled the Government witnesses for last.

**STATEMENT OF R. JOHN VOGEL, UNDER SECRETARY FOR BENEFITS, DEPARTMENT OF VETERANS AFFAIRS; ACCOMPANIED BY DR. SUSAN MATHER, ASSISTANT CHIEF MEDICAL DIRECTOR FOR PUBLIC HEALTH AND ENVIRONMENTAL HAZARDS; AND JOAN MA PIERRE, DIRECTOR, ELECTRONICS AND SYSTEMS, DEFENSE NUCLEAR AGENCY**

**STATEMENT OF R. JOHN VOGEL**

Mr. VOGEL. Thank you, Mr. Chairman. Mr. Chairman, to my right is Dr. Susan Mather and to my left, Gary Hickman, Director of Compensation and Pension Service in VBA.

I'm pleased to be with you today to discuss VA benefits based on disabilities and deaths which may be related to veterans' exposure to ionizing radiation during military service.

Service connection for radiation-related disabilities or deaths is established under either the statutory presumptions created by Public Law 100-321 or regulations VA has promulgated pursuant to Public Law 98-542.

In Public Law 95-542, Congress instructed the VA to issue regulations ensuring compensation to veterans and their survivors for disabilities or deaths related to exposure to ionizing radiation. We responded by publishing 38 CFR 3.311 which specifies 22 radiogenic diseases and the time periods within which each must occur. It also provides that we will consider other diseases shown by competent scientific medical evidence to be radiogenic.

If a veteran alleges radiation exposures from atmospheric testing or postwar occupation of Nagasaki or Hiroshima, VA obtains dose information from Defense Nuclear Agency. If other types of expo-

sure are involved, we're responsible for preparing a dose estimate from any available official military records. In all situations, however, a veteran is permitted to submit an alternative dose estimate from a person certified to have the requisite scientific expertise.

When it is established that radiation exposure occurred in the service and a radiogenic disease has been suffered within certain time limits, the claim is referred to our Central Office for review and an advisory opinion from the Director of the Compensation and Pension Service. The advisory opinion contains the rationale as to whether it is at least as likely as not that the claimed disease resulted from radiation exposure. A positive finding in this regard is adequate to support service connection. Prior to issuing the opinion, however, we obtain the advice from the Chief Public Health and Environmental Hazards Officer.

Since Public Law 98-542 does not provide compensation on a presumptive basis, the "Radiation Exposed Veteran Compensation Act of 1988," Public Law 100-321, authorizes compensation on a presumptive basis for certain radiation exposed veterans who developed one of 13 specified diseases to a degree of 10 percent within 40 years following exposure.

The list of presumptive radiogenic conditions was expanded with the "Veterans Radiation Exposure Amendment of 1992," Public Law 100-578, which added cancers of the salivary gland and urinary tract. This law also removed the requirement that a disease must have appeared to a degree of 10 percent or more within 40 years after exposure.

One other noteworthy provision of Public Law 98-542 is its authorization of the Veterans Advisory Committee on Environmental Hazards which advises VA on the relationships of various diseases to radiation exposure. Recently, that committee recommended that prostate cancer be added to the list of conditions that may result from radiation exposure. We are in the process of proposing a rule change to implement that recommendation.

Additionally, last fall, the President's Advisory Committee on Human Radiation Experiments recommended that VA consider the feasibility of updating and expanding the radio-epidemiological tables that we rely upon to determine the likelihood that certain diseases could result from exposure to ionizing radiation. The President's Advisory Committee further recommended that the VA review existing laws and regulations that govern compensation. VA Secretary Jesse Brown, along with his colleagues, Secretary of Defense William Perry and Secretary of Health and Human Services, Donna Shalala, appointed representatives to the VA Human Radiation Interagency Working Group, which I chair, to address these recommendations. We expect to complete our response within the next 60 days.

I would next like to mention the medical treatment and other health care services available to radiation-exposed veterans.

Currently, VA provides veterans exposed to ionizing radiation as a result of participation in atmospheric tests or the occupation of Hiroshima and Nagasaki with free, comprehensive medical examinations, including base-line laboratory tests and other diagnostic tests deemed by an examining physician necessary to determine current health status. Results of the examination, which include

preparation of the veteran's military service and exposure history, are entered into a special, computerized program known as VA's Ionizing Radiation Registry. These data assist VA in analyzing the types of health conditions being reported by veterans. Over 20,000 veterans participate in the registry program.

Even more significantly, since 1981, these same veterans have been eligible for VA health care for all conditions except those that VA affirmatively determines have causes other than the radiation exposures.

Mr. Chairman, there's no doubt that these individuals have sacrificed for the welfare of this country and it is our job to see to it that their sacrifices are appropriately recognized. We are privileged to administer programs that benefit them and their families. I and my colleagues would be pleased to answer any questions that you or any other members of the subcommittee may have.

[The prepared statement of Mr. Vogel appears on p. 92.]

Mr. EVERETT. Thank you. Ms. Pierre.

#### STATEMENT OF JOAN MA PIERRE

Ms. PIERRE. At this time I request that my written statement be entered into the record.

Mr. EVERETT. Without objection.

Ms. PIERRE. Thank you. I am Joan Ma Pierre, the Director for Electronics and Systems at the Defense Nuclear Agency. My agency serves as the Executive Agent for the Nuclear Test Personnel Review or NTPR. This is a program that assists atomic veterans and their families or designated representatives by providing participation data and radiation dose information.

I am also the Director of the Radiation Experiments Command Center. It was established by the Department of Defense in 1994 in response to the President's initiative to make information about human radiation experiments that occurred during the Cold War available to the public.

NTPR has identified approximately 400,000 veterans who participated in the U.S. atmospheric nuclear tests and the post-World War II occupation of Hiroshima and Nagasaki.

The early research phase of the program included a labor intensive and time consuming effort to locate, retrieve, declassify and archive information, prepare histories of the tests, conduct studies, create data bases and so forth. For approximately the last decade our activities have focused primarily on public outreach and service to the veterans.

My agency plays no role in the claims adjudication process. The Department of Veterans Affairs and the Department of Justice are solely responsible for determining the merits of claims and administering benefits or granting compensation.

With regard to the human radiation experiments, the HRE initiative, the Department of Defense is a member of the inter-agency working group that's chaired by the Department of Energy. DOD identified approximately 2,600 potential activities which may have exposed human subjects to radiation. The number is large due to a conscious decision to err on the side of inclusion, to insure that all available records are preserved and are made accessible to the public.

We estimate that the number of experiments is much smaller, if exposures such as those due to common and routine clinical practices are excluded. At present, the DOD is actively participating in the inter-agency working group process to respond to the recommendations that were made by the Advisory Committee on Human Radiation Experiments that was shared by Dr. Ruth Faden.

Mr. Chairman, this concludes my remarks. Thank you for the opportunity to represent the Defense Nuclear Agency and the Department of Defense. At this time I would be pleased to take any questions that you or any members of the subcommittee might have.

[The prepared statement of Ms. Pierre appears on p. 97.]

Mr. EVERETT. Thank you very much. John, let's start with you. It appears that about 18,000 people have applied for radiation-related benefits and about 10 percent have been awarded some kind of compensation. 463 have been awarded compensation from the presumptive list. Are these figures, to the best of your knowledge, accurate?

Mr. VOGEL. Yes, they are, Mr. Chairman.

Mr. EVERETT. Do those rates of allowances compare favorably to the overall claims' allowance rate?

Mr. VOGEL. I am going to ask Mr. Hickman to respond, Mr. Chairman.

Mr. HICKMAN. Mr. Chairman. The statistics of the 18,000 who have filed claims because of radiation exposure or for other conditions, indicate that we have granted a service connection to 8,700, not all because of radiation exposure, but due to incidents in service. Therefore, the statistics would be about 47 percent of those who have filed have received some type of service connection.

You asked a question specifically about radiation. The grant rate for just radiation is much less than what we would normally do. As you can see, 47 percent, as normal incidents in service, in combination with radiation, is much higher. It depends on how you look at it. If you look at it in general terms, the allowances are probably about average. When we just look at radiation only, allowances are lower than average.

Mr. EVERETT. Is there a centralized location for adjudication of radiation claims?

Mr. VOGEL. No, Mr. Chairman. Those claims are adjudicated in each of our regional offices.

Mr. EVERETT. What kind of training do adjudicators and doctors receive in this area?

Mr. VOGEL. We target special training available through our training academy. We conduct regular routine reviews of claims such as these in the Compensation and Pension Service to try to assure that the offices are adhering to applicable principles and the laws that govern such claims.

Mr. HICKMAN. Mr. Chairman, if I could supplement Mr. Vogel's remark. When a claim comes in based upon radiation exposure, the regional office must go out and obtain radiation dose from the Defense Nuclear Agency. Once they have that information, then they send it in to Washington. In essence, it is centrally reviewed here for adequacy. We obtain an opinion from the Veterans Health Administration regarding the likelihood that the amount of radiation

the individual received caused this condition. From that standpoint, we do look at it and send it back out to the regional office to make the final adjudication.

Mr. EVERETT. How long does it take to get a dose reconstruction?

Mr. HICKMAN. Dose reconstruction, I'll have to defer to DNA at this point in time. I think it varies from case to case, probably a month to several months, depending upon the situation.

Ms. PIERRE. Let me just comment that in connection with requests that we receive from the DVA, it takes us approximately 120 days, on average, to process those cases. In those instances, where dose reconstruction is required, then an additional factor of time is required, depending on the complexity of the case.

Mr. EVERETT. How long? From what point to what point—from a month to 3 months?

Ms. PIERRE. From the time that we receive the request from the VA to the time that we respond is about 120 days. Sometimes it may take much longer than that.

Mr. Chairman, as an example, some of the records that pertain to veterans were destroyed in the major fire in St. Louis in the 1970s. So in a case such as that, more care and time are required to provide the dose information.

Mr. EVERETT. I'm trying to get a handle on the additional time that's required.

Ms. PIERRE. It could be another factor of 2, say 3 to 4 months.

Mr. EVERETT. Two to 4 months?

Ms. PIERRE. In addition to the 3 or 4 months.

Mr. EVERETT. Thank you. John, you said earlier that Defense Nuclear Agency estimates are that about 405,000 veterans took part in the nuclear tests during occupation in Japan. How many veterans are known on the VA radiation register?

Mr. VOGEL. Just a little over 20,000, Mr. Chairman, 20,300.

Mr. EVERETT. I've got some other questions I'm going to submit for the record. Ms. Pierre, in your testimony you had a total of 405,000 participants in the occupation of Japan in various nuclear tests. Do you know how many are alive today?

Ms. PIERRE. No, I do not.

Mr. EVERETT. Do you think other classes of veterans such as those cited by the Legion should be added?

Ms. PIERRE. I'm sorry, would you repeat that?

Mr. EVERETT. Do you think other veterans, going back to the testimony of the American Legion, should also be added to the list?

Ms. PIERRE. I think that is up to the discretion of the Congress. We'll respond to whatever the laws require.

Mr. EVERETT. Will you please describe the process of dose reconstruction?

Ms. PIERRE. Dose reconstruction is a complicated process. I'd be pleased to provide that methodology for the record.

Mr. EVERETT. All veterans—I appreciate that—all veteran witnesses here today have expressed serious reservations about the accuracy of dose reconstruction. How would you respond to their concerns?

Ms. PIERRE. I would say that based on the laws we are required to provide estimated dose when measured information is not available. I can appreciate the frustration on the part of the veterans.

The dose reconstruction methodology is one that is developed and published in the Federal Register. It has been received, excuse me, it has been reviewed by scientific groups such as the National Academy of Sciences and on many occasions it has been re-examined by entities such as the General Accounting Office and other groups.

In general, the major criticism of the methodology by the review groups has been that the doses assigned had been too high. As I have said, this is a complicated method and I'd be pleased to provide the details on the method for the record.

(The information follows:)

Dose reconstruction is required whenever film badge data are not available or are inadequate to quantify potential exposures. For example, film badges were not worn or the badges were lost or damaged. In addition, the film badges worn by the veterans were insensitive to neutron radiation. Dose reconstructions are needed to ensure that the veterans receive a complete accounting of their potential for radiation exposure.

The process of dose reconstruction encompasses three steps: characterization of the radiation environments to which an individual could have been exposed, determination of the individual's activities and location within the environments, and computation of the external and internal doses using scientifically tested and peer reviewed models.

The first step takes into account the various radiation environments to which the individual might have been exposed, such as gamma and neutron radiation emitted by and shortly after the detonation, the gamma emission from the soil made radioactive by the neutrons, and the radiation from fallout in the air and on the ground after the detonation. We can characterize these environments from physical measurements of radiation at various times and points after detonation and from radiochemical sampling of the detonation debris. Debris analysis determines the amount and number of radioactive elements resulting from the detonation. All types of radiation from the elements in debris are considered in dose reconstructions.

The second step involves searching military and operational records and historical documentation for details of where the individual was, in what activities he was engaged, and the time and duration of the exposure period with respect to the time of detonation. Other factors, such as being shielded by the structure of a building, the hull or deck of a ship, or trench, are noted if such information is available. Information provided by the veteran is also considered in the time/location analysis unless it is demonstrably inaccurate.

The last step consists of inserting all of the data gathered in the first two steps of the process into computer models. The veteran's time and location data are merged with the radiation environment data to arrive at the dose. The models use scientifically accepted principles, to compensate for the passage of gamma and neutron radiation through air and shielding.

The degree of debris (fallout) dropping through the atmosphere or resuspended from ground level activities, such as marches or maneuvers, is also calculated. Physical and biological models consider the amount of fallout inhaled or ingested and its time of passage through, retention by, and elimination from critical organs. All radiation emissions (alpha, beta and gamma) from elements identified in the fallout form the basis for the dose resulting from internalized fallout.

Reconstructed doses are reported as external doses (gamma and neutron) and the internal doses to specified organs. An uncertainty analysis provides a calculated average dose with confidence limits. Following public comment, the Nuclear Test Personnel Review dose reconstruction methodology was published in 1985 in the Federal Register, 32 CFR 218. The National Academy of Sciences published a review of the methodology in 1985, concluding that the method was adequate and tended to overestimate doses.

Mr. EVERETT. I appreciate it, Lane.

Mr. EVANS. Thank you, Mr. Chairman. Mr. Vogel, you are certain your testimony, of course, that the veteran has a right to submit an independent dose reconstruction. Do you have any idea what that costs?

Mr. VOGEL. How much it would cost the individual veteran?

Mr. EVANS. Right.

Mr. VOGEL. I wouldn't know what that would entail. Maybe someone from one of the groups that testified earlier could respond.

Mr. EVANS. I guess my point is they're expensive and I don't know if one of the ESLs here would want to give me some idea, but I think in effect it's arrived without meaning because most veterans were at these atomic tests or Hiroshima or Nagasaki and they're simply not very wealthy individuals by and large to afford that kind of independent testing. So I just didn't now if you had any idea.

Mr. VOGEL. I'm sorry, Mr. Evans, I don't.

Mr. EVANS. If you could submit something for the record, it would be helpful to us.

Have you done a kind of analysis of why so many atomic veterans have been denied compensation benefits? I would find that this could be helpful in trying to live up to the VA's duty to assist veterans in making their claims.

Mr. VOGEL. I think we heard earlier, Mr. Evans, it's the reconstruction of dose estimates which is the difficult hurdle, very frankly. I believe, as suggested earlier, that DOD, with respect to the Defense Nuclear Agency, and VA err always on the side of liberality. Most claims require reconstruction dose estimates. They're the ones that are of greatest concern to our veterans.

Mr. EVANS. Do you have any documents about that issue?

Dr. MATHER. I think that there are two reasons. One is the exposure is judged too low to have caused the disease of record or else the disease for which claims are being filed is not considered to be radiogenic. I think those are the two broad categories. Either insufficient exposure or a disease that is not generally considered to be radiogenic, such as hardening of the arteries or degenerative joint disease.

Mr. EVANS. Many veterans have expressed problems with VA health care, atomic veterans, Mr. Vogel. Would you respond in detail perhaps in a written statement as to what you've been doing specifically for atomic veterans. I did note in your testimony that atomic veterans have been eligible for VA health care for all conditions except those at the VA "affirmatively determined their causes other than radiation exposure." Do you have a list of those illnesses or is that done on a case by case basis and what has been the process for which the VA has affirmatively determined that there's no connection concerning radiation exposure?

Dr. MATHER. Generally speaking, either a disease that has a well-known cause not related to radiation or a problem that starts with a specific event such as an automobile accident. We do try to side with the veteran if it's unclear.

Mr. EVANS. If the veteran had a problem related to an illness that he or she might think was connected to their experiences as atomic veterans, let's say skin cancer that's not recognized at this point, would they be able to get treatment for that skin cancer?

Dr. MATHER. Generally speaking, as far as treatment goes, yes. This should not be a problem because it would be unclear exactly what the cause of the skin cancer was, although in some cases there is a significant exposure to sunshine. Sometimes occupational or leisure activities have led to a significant exposure to sunshine, which is a known cause of skin cancer.

Mr. EVANS. Mr. Chairman, I have so many questions I think it would be better to submit to the record with detailed answers.

Mr. EVERETT. Thank you. Let me just ask one final question, John. Testimony here today suggested the 22 radiogenic diseases listed in 38 CFR 3.311 and the 25 diseases for which Marshall Islanders are compensated should be added to the presumptive list in title 38. Does the Department feel we should add those radiogenic diseases to the presumptive list?

Mr. VOGEL. Mr. Chairman, I'm not in a position today to give you an Administration position on it. However, based on the testimony today and as chair of the Interagency Working Group, I see a need to work with the groups testifying today and veterans from the science ethics community before presenting an agency or government position on the current roles used to adjudicate these claims.

Mr. EVERETT. Thank you very much and I thank the panel for its testimony today.

Our final panel is composed of Dr. Ruth Faden, Chairwoman of the Advisory Committee on Human Radiation Experiments. The Advisory Committee published its report last fall and I'm eager to hear her testimony. Dr. Faden.

#### **STATEMENT OF DR. RUTH FADEN, CHAIRWOMAN, ADVISORY COMMITTEE ON HUMAN RADIATION EXPERIMENTS**

Dr. FADEN. Let me begin by apologizing to all assembled here. I was very appreciative of the opportunity testify this morning and to seek on behalf often Advisory Committee that my wonderful intentions were waylaid first by a traffic jam and then my car died and I spent the past half hour on a DC city bus which turned out to be great fun. It caused me to be a bit delayed in appearing before the subcommittee.

Let me begin first of all by saying how delighted all of us are as former members of the Advisory Committee that this subcommittee has taken the opportunity to look at a series of issues that we believe are of significant importance and that require attention by Congress.

The Advisory Committee was entitled The Advisory Committee on Human Radiation Experiments. It was chartered by President Clinton in January of 1994. We were 14 private citizens and one member of the general public and most of us were selected because of expertise in a range of disciplines including medical ethics which is my own area of specialty, radiation oncology, radiation biology, nuclear medicine, epidemiology, biostatistics, public health, history of science, history of medicine and law.

I have appended a copy of our Executive Summary which tells you more than you probably need to know about the origins and charge and scope of work for the committee. More relevantly, I have also appended to my testimony a copy of Chapter 10 of our report which is entitled, "The Atomic Veterans Human Experimentation in Connection with Bomb Tests." It is that chapter, it is in that chapter that we delivered ourselves of our major findings with respect to the experience of atomic veterans. I have also appended our recommendations that are specific to atomic veterans with regard to fair treatment of atomic veterans. They are found in their entirety in the last chapter of our report.

There probably is very little that I can add to the testimony that you've heard this morning from representatives of atomic veterans advocacy groups. I'll start out by saying the committee was not specifically chartered to review the experience of the atomic veterans or the experience of troops present at bomb blasts. However, very early in our tenure as a committee we heard forcefully from atomic veterans, from their family members about the importance of including their experience in our review. It was their position that there was a very real sense in which all of the atomic veterans had been participants in a massive historical experiment.

We were obviously focused on a classic understanding of experiments with human beings. It was also alleged that there was such experimentation with servicemen conducted in conjunction with the atomic bomb blasts and we set about to investigate that specific allegation.

We reviewed the historical record and established that it is correct that some human experiments were conducted in conjunction with atomic bomb blasts in which service personnel served as human subjects. We estimate that somewhere in the range of 2,000 to 3,000 service personnel served as or were used as human subjects in human experimentation conducted in conjunction with the tests. These 2,000 to 3,000 obviously make up a very small portion of this several hundred thousand servicemen who were involved in activities in conjunction with bomb tests and as we began to pursue the issues, it became very clear that there were not many relevant differences from a moral point of view between the service personnel who were used as human subjects and the other service personnel with some notable exceptions, the level of risk, the level of exposure was not usually different for those people who were involved in experimentation and the other service personnel, nor in most cases were the kinds of activities markedly different between those that were officially now understood as human subjects of biomedical experimentation and the other service personnel. So, for example, to give you an illustration there were some air crew who flew through clouds at bomb test sites for the purpose of determining the extent of human exposure and that would be a human experiment.

There were also air crew, many more, who flew through the same kinds of clouds to measure exposure to aircraft or to measure the amount of radiation in the clouds. That was not a human experiment, so you had air crew involved in two activities that would look very much the same, but one would be in retrospect associated with human experimentation and the other would not.

The Department of Defense did not distinguish between these activities either with respect to the way in which people were assigned or recruited, nor with respect to compensation, follow up or notification. So increasingly as the committee did its work, we came to see that while there were some issues that were distinct or specific to human experimentation, really the overwhelming issues that needed to be addressed had to do with the entire experience of atomic veterans. The recommendations that the committee made speak to the general issues and I will summarize them very briefly.

First, the major thing that the Advisory Committee wanted to have happen is the process that you will be given today for which we are very grateful, namely, that there be attention paid by the Administration, but also by Congress to what extent the atomic veterans' community has been treated fairly today in terms of issuance of compensation and remedy. Specifically, the Advisory Committee did recommend that Congress give serious consideration to reviewing and updating the epidemiological tables which serve as the basis for compensation under, in particular, the 1988 legislation. We believe that as a committee, we believed that it was important and proper and fitting that these tables be reexamined and that atomic veterans had the benefit of the latest scientific understanding as decisions are made about their individual cases.

Secondly, and this I really cannot add very much to what you've already heard today and received in written testimony, we heard over and over and over again from atomic veterans and from their families that substantial difficulties they perceived that they had personally experienced in attempting to receive compensation under existing laws or problems that they saw overall with the system.

We were not in a position to pursue these concerns, but we were very much affected by the seriousness and the apparent extent to which this is perceived as a widespread problem within the atomic veterans community who believe the concerns are substantial enough that they warrant congressional attention.

I'll just summarize the kinds of things that we heard, so really we're functioning as a pass through. We operated for 18 months, took a lot of testimony, heard from a lot of people by mail and in person and want to officially now pass these concerns on to a body that is in a position to pursue them in a way in which we were not chartered to do.

First, which you've already heard, the adequacy of the presumptive diseases list, whether that list is complete and adequate and obviously there is concern in the affected community that it is not. Secondly, concerns about the standard of proof of those with the condition that is not currently on the presumptive list. And this speaks to the inadequacy of the record keeping, the availability of records today which makes it extremely difficult, apparently for atomic veterans and their families to meet the standard of proof.

I can say from the perspective of the Advisory Committee that there clearly is evidence that the record keeping at the time and today was inadequate and that was one of the major findings of the Advisory Committee. A third concern was that the statutes are limited and inequitable in their coverage. Some people who had exposures that were parallel to those covered are not. Service personnel expressed that the expense needed to prosecute a claim is too great and finally that the time and money spent on contractors could be better spent and this is the claim that's made by veterans and their survivors.

I would like to make one final comment about the state of records of exposure today. The committee is very much committed not only to investigating the past, but also to learning from that history with respect to the present and the future. The experience of atomic veterans is an opportunity not only for us to treat fairly

people who have served their country and deserve our highest consideration, but also to focus on the veterans of tomorrow and to pay attention to the need and the importance for a complex of reasons, but also for important moral reasons of keeping appropriate records with respect to exposure of service personnel to potential hazards so that 50 years from now there doesn't have to be another hearing with the same sorts of concerns being raised and in our report and the materials that I appended there are some specific suggestions with regard to record keeping and we thank the subcommittee for this opportunity and I'm happy to answer any questions.

[The prepared statement of Dr. Faden, with attachments, appears on p. 101.]

Mr. EVERETT. Thank you very much. I appreciate your testimony. Your full testimony will be entered into the record. Also, thank you for your struggle in getting here this morning.

Dr. FADEN. I apologize.

Mr. EVERETT. Lane.

Mr. EVANS. Thank you, Mr. Chairman. Doctor, you indicated one of the concerns of the committee was that veterans were complaining about the time and money spent by contractors and consultants in administrating the program. Does that specifically pertain to the Defense Nuclear Agency?

Dr. FADEN. Yes, but again what I want to emphasize what we are doing is passing on the concerns that we heard. We heard this over and over and over again that there was tremendous time and expense involved, that it was a very difficult process and they were thwarted at many turns and people were obviously very unhappy.

Mr. EVANS. Do you know how much an individual dose reconstruction would cost for a veteran?

Dr. FADEN. I don't. I think I might have known, but I don't know.

Mr. EVANS. Can you get some information to us?

Dr. FADEN. I'm sure I could.

Mr. EVANS. There's a feeling that the DNA does reconstruction and they're not conducted properly. Did your committee come away with any conclusions as to the accuracy of the DNA dose reconstruction?

Dr. FADEN. No, we did not. We're not investigating the adequacy of the dose reconstruction.

Mr. EVANS. Thank you, Mr. Chairman.

Mr. EVERETT. Thank you for your testimony.

Dr. FADEN. My pleasure, thank you.

Mr. EVERETT. I hope that each of the organizations before us today, especially those representing the Government, will leave here with a renewed sense of commitment for our atomic veterans and their survivors. I realize it is a difficult issue. We should not compensate every atomic veteran who falls ill, but neither should we put in place a system that simply doesn't work.

I'd also like to take this opportunity to thank our ranking member, Lane Evans, for his leadership and his hard work on this issue. I look forward to working with each of you to make the system more responsive.

This meeting is adjourned.

[Whereupon, at 11:07 a.m., the subcommittee was adjourned.]

## **A P P E N D I X**

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Honorable Terry Everett  
Chairman  
Subcommittee on Compensation, Pension,  
Insurance and Memorial Affairs  
Remarks  
Atomic Veterans Hearing  
April 30, 1996

Good morning. The Subcommittee will come to order. We are here today to receive testimony regarding the performance of the VA's compensation program for those exposed to ionizing radiation.

A look at the numbers presents some disturbing facts. Only about 10% of those applying for radiation-related compensation have been approved. Possibly that is why VA's written testimony was so short of facts. I hope Mr. Vogel and other government witnesses will be able to further inform us of what is actually going on and offer some explanation of why so few radiation claims are allowed.

I know this is a complex subject and there is significant disagreement within the scientific community as to the dangers associated with exposure to radiation. But that is no excuse for inaction on the part of the government, and I hope to hear some ways to improve the situation.

I am particularly disturbed by the cases cited by the DAV which appear to portray an overly parsimonious VA when it comes to radiation-related compensation. I would also note that the process to get compensation in this area is much more convoluted than other claims.

Before we proceed, I'd like to recognize the distinguished Ranking Member of the Subcommittee, Lane Evans for any remarks he may have.

Thank you Lane. Do any other members have any remarks before we begin testimony?

April 30, 1996

Statement of Rep. Lane Evans (D-IL)  
Oversight Hearing on the Effects of Veterans of Exposure to Ionizing  
Radiation, Subsequent Treatment, and Compensation  
Subcommittee on Compensation, Pension, Insurance and Memorial  
Affairs

Mr, Chairman, thank you for holding this hearing on the effects of ionizing radiation on our nation's veterans. I look forward to hearing from our witnesses today and exploring what the Department of Veterans Affairs and this subcommittee can do in the future to see that their sacrifices and needs are recognized.

There can be no question that atomic veterans were not adequately informed of the dangers of ionizing radiation and may have been injured as a result. Many of these men and women have paid for their dedication and bravery with their health and some with their lives. We owe it to them to see that they are not forgotten and that they receive the compensation and care they deserve. This hearing is a small, but important step in ensuring that we fulfill our duty to them.

Central to our work today will be the recommendations of the Advisory Committee on Human Radiation Experimentation. While much of the report focused on experimentation on civilians, the recommendations contained in the report concerning atomic veterans are an indictment of how our government has failed these vets. The recommendations of the committee mirror many of the concerns that the atomic veterans groups have had for years: that the list of presumptive diseases contained in law is inadequate, that the standard of proof to meet administrative claims is often impossible to meet, and that these statutes are limited and inequitable in their coverage.

I look forward to hearing from Dr. Faden today on her Committee's work. I also know that the VA's Human Radiation Interagency Working Group is currently meeting to come up with a response to the Advisory Committee's recommendations. I hope that through this hearing we can get an idea of where they are in the process and urge them to fully adopt these recommendations.

In the meantime, Congress must provide the necessary leadership to ensure that these veterans' needs are met. In the near future I will be introducing my own legislation, based on the precedent set by the Marshall Islands Nuclear Claims Tribunal Act, which will provide additional presumptive diseases for Atomic veterans. Currently, Marshall Islanders receive compensation if they exhibit one or more of the 27 illnesses presumed radiogenic in nature. My legislation would ensure that all of the radiogenic illnesses that Marshall Islanders are compensated for are also on the presumptive list for our nation's vets. The least we can do is to make sure that they receive compensation for illnesses already determined by our government to be linked to exposure to ionizing radiation. Today's hearing should only reinforce the need for this legislation.

Again, thank you Mr. Chariman for holding this important hearing. I look forward to working with you and all of our witnesses today to see that our atomic veterans are given the recognition and assistance they deserve.

Rep. Jerry Weller  
Compensation, Pension, Insurance  
& Memorial Affairs Sub-Committee Statement  
April 30, 1996

I want to add my appreciation to that expressed by my colleagues, to veterans organizations in general for their service, dedication and hard work on behalf of America's veterans. I especially want to thank the veterans groups that are here with us today.

I believe that all of you here today would agree that improving service to our veterans, as well as ensuring sufficient funding for veterans' programs, should be among our sub-committee's top priorities. I want to assure you that I will be working closely with all veterans' service organizations, and in fact, have met with several of these organizations in the last few months to discuss their concerns and suggestions to improve the current system. I have also formed a local veterans' advisory committee that I have found very helpful and insightful in addressing local veterans' concerns and needs.

Mr. Chairman, I look forward to hearing the testimony before us today regarding the effects of ionizing radiation and our nation's veterans.

**STATEMENT OF  
 PHILIP WILKERSON  
 DEPUTY DIRECTOR FOR OPERATIONS  
 NATIONAL VETERANS AFFAIRS AND REHABILITATION COMMISSION  
 THE AMERICAN LEGION  
 BEFORE THE  
 SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE  
 AND MEMORIAL AFFAIRS  
 COMMITTEE ON VETERANS' AFFAIRS  
 UNITED STATES HOUSE OF REPRESENTATIVES  
 ON  
 RADIATION OVERSIGHT  
April 30, 1996**

Mr. Chairman and Members of the Subcommittee:

The American Legion appreciates the opportunity to express its views on issues relating to the health and welfare of those veterans exposed to ionizing radiation during their active military service. We wish to commend you, Mr. Chairman, for holding this oversight hearing to address the needs of this particular group of veterans and their families.

During the period of 1945-1962, according to the Department of Energy, approximately 347,000 active duty personnel were involved in 235 atmospheric nuclear weapons tests that were conducted in the continental United States, the Pacific, South Atlantic, and off the coast of Alaska. At the end of World War II, many Americans were being held as prisoners-of-war in Japan near the cities of Hiroshima and Nagasaki. Subsequently, U.S. forces also occupied these cities soon after the atomic bombs were dropped. Since 1963, there have been 204 underground nuclear weapons tests, and through the years, military personnel have also performed duty at nuclear weapons development, manufacturing, and testing facilities and sites, such as the Manhattan Project; Alamogordo; New Mexico; Hanford; Washington; and others that involved the risk of radiation exposure.

The debate surrounding radiation exposure and the long-term health consequences for those exposed veterans as well as thousands of civilians continues. The American Legion believes many of the studies conducted over the years have been less than credible. Almost all have included a disclaimer that although there is a statistically significant finding, there is no proof that the increased incidence of a particular disease or diseases is related to radiation exposure or that very few veterans were exposed to harmful amounts of radiation. Recent disclosures in the media have revealed to the public for the first time previously classified information concerning secret nuclear weapons tests and instances of accidental or intentional release of radioactivity. Information has also come to light concerning the possibility of illegal radiation-related experiments on humans. Another area of concern is the potential health risks to many veterans who were treated with radium during military service. The American Legion continues to believe there is a need for more substantive research and follow-up studies on a variety of veteran populations.

Among veterans either present at nuclear tests, a POW in Japan, on occupation duty in Japan, or assigned to nuclear weapons manufacturing and test facilities, a significant number has subsequently developed various cancers and other similar diseases that have been scientifically linked to their personal history of exposure to radiation during their military service. In 1984,

Congress enacted PL 98-542 that established a list of diseases presumed to be related to exposure to ionizing radiation provided they were diagnosed within certain presumptive periods. PL 102-578, in 1991, expanded the list of recognized diseases to fifteen. The list recognizes: all forms of leukemia except chronic lymphatic (lymphocytic) leukemia; cancer of the thyroid; cancer of the breast; cancer of the pharynx; cancer of the esophagus; cancer of the stomach; cancer of the small intestine; cancer of the pancreas; multiple myeloma; lymphomas (except Hodgkin's disease); cancer of the bile ducts; cancer of the gall bladder, primary liver cancer (except if cirrhosis or hepatitis B is indicated); cancer of the salivary gland; and cancer of the urinary tract.

In a 1994 decision, the U.S. Court of Appeals for the Federal Circuit held in Combee v. Brown that the "radiogenic diseases" set forth in 38 CFR 3.311 did not constitute an exclusive list of conditions that may be recognized as service connected based on exposure to radiation. As a result, VA regulations have been amended to provide for the development of radiation dose estimates and medical opinion as to whether or not the veteran's disease resulted from exposure to radiation in those claims involving a radiogenic disease that did not become manifest within any of the applicable presumptive periods. If a claimed disease is not among those listed, the claimant can cite or submit competent scientific or medical evidence that the condition in question is a radiogenic disease. The claimant must, of course, also submit evidence relating to the circumstances of exposure and medical opinion linking the current diagnosis with military service.

Through the years, The American Legion has supported scientific research and legislation intended to ensure that veterans who were exposed to ionizing radiation as a result of the performance of active military service receive adequate compensation for often fatal diseases related to such exposure. We have a number of concerns with respect to the adjudication of claims by radiation-exposed veterans and their survivors, as well as certain issues related to medical care provided by VA.

#### **RESEARCH**

Since early 1994, VA has continued its review of and search for radiation records through the President's Advisory Committee on Human Radiation Experiments and through the Interagency Working Group (IAWG) on Human Radiation Research. The National Research Council (NRC), Institute of Medicine, Medical Follow-up Agency (MFUA) is conducting a mortality study of veterans who participated in certain above ground atomic tests during the 40's and 50's to determine if the incidence of illness is higher for atomic veterans than the rest of the military during the periods in question.

In their final report the Advisory Committee made several recommendations to the Interagency Working Group. These recommendations fall under three major areas: biomedical experiments and population exposures (1944-1974); current human subject protection; and secrecy and openness.

Recommendations 5 and 6, under biomedical experiments are of interest to the VA. Recommendation number 5 focuses on problems of radiation exposure at the Hanford Nuclear Reservation in Washington state during the period 1943 to 1962 and the need for an amendment to the Radiation Compensation Act of 1990 (PL 100-426) to cover individuals who may have been exposed to radiation in the area of that facility. According to records developed by the Portland State University in the late 1980's, some 28,000 veterans

were stationed at the Hanford Reservation in the period 1943-1962 and that these troops were at risk of exposure to varying levels of radiation. The American Legion believes that such legislative action should extend eligibility under this program to both those active duty personnel stationed at Hanford since 1943 and members of the civilian communities in that area. However, while a change to the Radiation Compensation Act would benefit this group of veterans, it should not be their only option. We strongly believe that the definition of "radiation-risk activity" set forth in 38 USC should also be amended to include individuals who performed active duty at facilities and activities such as Hanford.

Recommendation number 6 recommends that the IAWG, together with Congress, seriously consider reviewing and updating the epidemiological tables that are used "...to determine whether relief is appropriate for veterans who participated in atomic testing so that all cancers or other diseases for which there is a reasonable probability of causation by radiation exposure during active military service are clearly and unequivocally covered by the statutes."

It was further recommended by the Advisory Committee to the Interagency Group "...that it review whether existing laws governing the compensation of atomic veterans are now administered in ways that best balance allocation of resources between financial compensation to eligible atomic veterans and administrative costs, including the costs and scientific credibility of dose reconstruction."

In the view of The American Legion, most government studies to date have focused on individuals involved at the downstream end of the nuclear weapons program - the atmospheric nuclear weapons tests - while ignoring the upstream side of the program - veterans who served at those sites and facilities where these weapons of mass destruction were developed, manufactured, and stored. Time and the effects of radiation are working against these veterans. We believe it is time the government fulfilled its obligation to the thousands of veterans who actually built this nation's nuclear arsenal.

#### **RADIATION RISK ACTIVITY**

As previously noted, several hundreds of thousands of veterans participated in atmospheric nuclear weapons tests at various locations. It has also become increasingly clear that many other veterans were exposed to radiation during service while assigned to nuclear weapons development and testing programs such as the Manhattan Project during World War II and subsequent nuclear weapons development, manufacturing, and testing facilities such as Alamogordo, New Mexico and Hanford, Washington, etc., following World War II. These individuals, however, are not covered by the current presumptive provisions of 38 USC 1112(c)(3)(B). A significant number of veterans who were present at these test facilities have subsequently developed leukemia, thyroid conditions, various cancers, and other similar diseases that, based on scientific evidence, can be linked to their exposure to radiation in service. However, their claims can be considered under the 38 CFR 3.310 which requires radiation dose assessment and medical opinion as to whether or not the disease in question is related to such exposure.

The problem for these veterans or, in many instances, their survivors, is that all too often government information necessary to identify such individuals and the amount of radiation to which they may have been exposed is not available. It is, therefore, very difficult, if not impossible for this group of veterans or their survivors to obtain the evidence necessary to support their claim. In

its claims adjudication, VA is forced to rely on often questionable methodology and certain dose assumptions used in the radiation dose reconstruction because film badges and other vital historical data are scarce to non-existent. The result has been that atomic veterans, as a group, have not been treated fairly, under the current law and regulations.

Mr. Chairman, as previously stated, we urge that corrective legislation be enacted amending 38 USC 1112(c)(3)(B) to include in the definition of "radiation-risk activity" those individuals who were stationed at nuclear weapons development, manufacturing, and testing facilities and sites.

#### CENTRAL DATA BASE

The American Legion has long been concerned over the lack of any central data base with vital information about past nuclear weapons development and testing programs. We note the Advisory Committee found in their report "...the government did not create or maintain adequate records regarding the exposures of all participants, the identity and test locale of all participants, and the follow-up, to the extent it took place, of test participants. Witnesses before the Advisory Committee expressed strong concerns about the adequacy and operation of the current laws, including Federal record-keeping practices."

We agree with and lend our support to the Advisory Committee's recommendation that this issue be looked at and promptly addressed.

#### RADIOGENIC DISEASES

Mr. Chairman, under its rulemaking authority VA has continued to add conditions to the current list of radiogenic disease. The most recent additions included tumors of the brain and the central nervous system, rectal cancer, and lymphomas, other than Hodgkin's disease. VA is currently considering whether or not prostate cancer and bronchial alveolus cancer should be included.

We strongly encourage VA's continued evaluation of all current scientific research and medical information on the subject of radiation-related disease and the timely revision of its regulations based on the latest information available. VA has a very strong moral and legal duty to assist veterans in receiving compensation for any and all diseases or disabilities due to their service to this nation. We believe the current statutory presumptions are too limited and restrictive. They also do not recognize other in-service activities that may have exposed veterans to radiation and difficulty in obtaining the necessary proof or evidence.

In addition to nuclear weapons test participants, VA has recently begun to focus attention on the long-term health risks to veterans who may have received treatments in service during the 1940's and 1950's that involved irradiation of the nasopharynx through the use of radium-tipped applicators inserted through the nostrils. Nasopharyngeal (NP) radium treatments intended to shrink lymphoid tissue as a means of helping prevent ear injuries associated with atmospheric pressure changes among submariners, divers, and air crew members. This same type of procedure was the accepted medical treatment at the time for ear problems and, according to VA, during the period, as many as 2 million people in the United States, both military and civilians, may have received this form of treatment. In September 1995, a workshop on this subject was co-sponsored by VA, the Centers for Disease Control and Prevention, and the Yale University. One of the issues examined at this

workshop was the possibility of an epidemiologic study of veterans receiving such treatment during service. VA had earlier tried some preliminary studies, but found documentation of such treatment in the service medical records of a sample of naval submarine veterans generally lacking. A study of Army Air Corps veterans was not considered possible due to the fire at the National Personnel Records Center that destroyed millions of service medical records.

According to a recent VA news release, the Department is reviewing possible legislation that would allow veterans who were treated with NP radium in service to participate in VA's Ionizing Radiation Registry Program and to receive priority medical care for conditions that may be related to such radiation exposure. VA is also planning to increase physician education on issues related to NP radium treatment and is considering a possible pilot screening study.

The American Legion is very supportive of these initiatives. We urge VA to submit their legislative proposal as soon as possible and that Congress give it expeditious consideration. This action, together with efforts to increase physician awareness at the VA medical center level concerning the need to more thoroughly investigate veterans' medical histories, will help ensure that this group as well as all atomic veterans receive appropriate care from VA. We recommend that in the process of screening of applicants for medical care the veteran should be asked if he or she performed any military duties that may have involved possible radiation exposure, in order that any necessary medical follow-up and treatment can be provided.

Mr. Chairman, VA's efforts to care for these veterans are indeed laudable. There is also a need to address the problems facing them when they file a claim for VA disability or death benefits based on such in-service radiation exposure. They will be at a tremendous disadvantage, since the odds are very high that evidence relating to NP radium will be either missing from their service medical records or the records destroyed, through no fault of their own. This problem, coupled with the strict criteria of the law and regulations that currently applies to claims based on radiation exposure makes favorable action on their claims highly unlikely. We, therefore, believe VA needs to consider the expeditious development of new regulations and guidelines that will enable these veterans to have their claims fully and fairly considered.

In conclusion, some progress has been made towards addressing the problems associated with veterans exposed to radiation. However, we believe there is clearly a need for action to be taken on the issues brought before this Subcommittee today.

Mr. Chairman, that concludes our statement.

**STATEMENT OF**  
**JOSEPH A. VIOLANTE**  
**LEGISLATIVE COUNSEL**  
**OF THE**  
**DISABLED AMERICAN VETERANS**  
**BEFORE THE**  
**SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE**  
**AND MEMORIAL AFFAIRS**  
**OF THE COMMITTEE ON VETERANS' AFFAIRS**  
**U.S. HOUSE OF REPRESENTATIVES**  
**WASHINGTON, D.C.**  
**APRIL 30, 1996**

MISTER CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

On behalf of the more than one million members of the Disabled American Veterans (DAV) and its auxiliary, I wish to thank you for this opportunity to present DAV's views on the controversy surrounding access to Department of Veterans Affairs (VA) medical treatment and VA disability compensation for veterans exposed to ionizing radiation, referred to hereinafter as "atomic veterans."

At the outset, Mr. Chairman, we wish to thank you, Ranking Democratic Member Representative Evans, and the members of this subcommittee for scheduling today's oversight hearing regarding the problems experienced by atomic veterans with respect to access to VA health care and disability compensation. Clearly, action taken by this subcommittee will materially affect the lives of America's citizen/soldiers who were placed in harm's way by our government for the sole purpose of obtaining first-hand evidence about the effects of exposure to ionizing radiation.

As my testimony will show, some atomic veterans have not received adequate health care treatment for the ailments believed to be associated with radiation exposure. Nor have the vast majority of atomic veterans been compensated for their residual disabilities. The remedial legislation passed by Congress over the years has not had the desired effects and must be revisited in order to provide meaningful health care and disability compensation for this group of veterans.

As you know, Mr. Chairman, the issue of ionizing radiation and its potential adverse health effects have been present for more than 50 years. Atomic veterans and their loved ones have been patiently waiting for answers from the scientific and medical communities, as well as responses to their concerns from Congress and the VA. Unfortunately, all too often those answers were not forthcoming. Nor does it appear that definitive answers will ever be known. For each study done concluding one point, another study surfaces to discount the findings of the prior report. Thus, the debate rages, with no apparent end in sight.

Before I get into the specifics of VA health care for atomic veterans, let me state that atomic veterans experience the same frustrations as all other veterans who attempt to access the VA health care system -- a system inadequate to meet veterans' medical needs and their demand for services. The crisis in VA health care results from years of inadequate funding and a "patchwork" approach to addressing the health care needs of veterans. In addition, atomic veterans believe that their particular medical needs are not being adequately met because the physicians who examine them, for the most part, do not have expertise in the harmful effects produced in body tissue by exposure to ionizing radiation to properly diagnose their illnesses and injuries. In fact, some atomic veterans honestly believe that these physicians are "intent on not encouraging radiation claims and, therefore, play down the medical problems" of atomic veterans.

Generally speaking, receiving disability compensation from the VA is another frustrating aspect of the ionizing radiation debate. All too many radiation claims are denied due to the unanswered questions from the scientific and medical communities, the apparent failure of dose reconstruction methods to adequately reflect the true extent of radiation exposure experienced by

atomic veterans, and the inability to obtain meaningful adjudication of radiation claims. All too often, atomic veterans, their dependents and survivors are denied compensation from our government for the residual illness, disease, or death allegedly associated with exposure to ionizing radiation while others, such as the Marshall Islanders, receive compensation from the United States Government for the same disability(ies).

Before getting to the specifics of my testimony regarding access to VA health care and the payment of disability compensation for atomic veterans, I would note for the record that the DAV membership, present at our National Convention in Las Vegas, Nevada in July 1995, adopted a resolution in support of a military medal to recognize and honor the courage, sacrifice and devotion to duty of those veterans exposed to ionizing radiation during military service. This is but a small step towards recognizing the honorable service of these brave men and women, and we call upon the members of this subcommittee to support such legislation.

I also call your attention to another resolution passed by the delegates at our last National Convention in Las Vegas, Nevada, noting the inaccuracy of dose reconstruction estimates provided by the Defense Nuclear Agency (DNA) and calling for the condemnation of this action by DNA as well as urging the VA to undertake a review of the accuracy of dose reconstruction estimates by DNA. Your kind attention to this matter would be greatly appreciated.

At the very least, our government needs to take immediate action on these two items.

#### **CONTROVERSY SURROUNDING POTENTIAL HEALTH EFFECTS OF EXPOSURE TO IONIZING RADIATION**

Radiation exposure may be external or internal. External radiation exposure occurs when the radiation source is outside the body. External exposure can come from standing in a cloud of radioactive gas, swimming in water that has radioactive material in it, or x-rays. Internal radiation exposure occurs when radioactive material is taken into the body by such means as eating, breathing, drinking, or through cuts or breaks in the skin. Both external and internal radiation exposure can directly harm internal organs, cells, and tissues.

After radioactive material is taken into the body, some of it may enter the bloodstream. This blood then flows through various organs and tissues in the body, providing them with material necessary for their functioning. The body does not distinguish between radioactive and nonradioactive materials. Sometimes, radioactive substances concentrate primarily in one organ of the body and that organ, therefore, receives a larger dose of radioactive substance than do other organs. Other times, the radiation substance is distributed throughout the body. The dose received by different parts of the body depends on a number of factors, including whether the radiation substance dissolves easily in the blood, the type and energy of the radioactive material, the amount of radioactivity present, and its distribution in the body.

The radioactive substance, once taken into the body, will continue to give off radiation until either it has decayed or is eliminated from the body through normal metabolism. The rate of decay depends on the radioactive substance's half-life -- the time required for a radioactive substance to lose one-half of its activity by radioactive decay. Half-lives for different radioactive substances vary from hours to thousands of years. Plutonium, for example, has a half-life of 24,100 years.

For obvious reasons, researchers know more about the effects of high-dose radiation on the immune system than about low-dose radiation exposure. High-dose radiation is defined as any exposure above fifty rad to the whole body. A rad is the unit of radiation dose used to measure the amount of energy a body absorbs from ionizing radiation. Information on the effects of high-dose radiation exposure comes from studies of Japanese atomic bomb victims, radiation accidents, such as the accident at Chernobyl, and studies of Marshall Islanders exposed to radiation fallout from nuclear tests in the 1950s.

Less is known about low-dose exposure -- less than fifty rads to the whole body -- and its effect on the immune system because of the delayed period of time between the incident of

exposure and the development of the disease. The late effects may show up months, years, or even decades after the exposure.

Currently, there is much controversy surrounding the adverse health effects resulting from low-dose exposure to radioactive substances. Some believe that even the smallest exposure to radiation has the potential to cause an adverse health effect. And, while it is probably safe to say that exposure to radiation increases the risk of cancer, the controversy involves which cancers are caused by radiation exposure and at what levels of exposure.

For example, the National Research Council's Fifth Committee on the Biological Effects of Ionizing Radiation (known as "BEIR V") concluded that the information from scientific studies about people who received doses under ten rem (the unit of dose equivalent, which is the amount of any ionizing radiation that produces the same biological effect as one rad of gamma or X-radiation) was insufficient to determine cancer risk. Over all, however, BEIR V concluded that cancer risk from radiation exposure is higher than regulatory and advisory groups had previously described. Some scientists reach quite different conclusions, arguing that the BEIR V report overstated the risk of radiation-induced cancer, while other scientists argue that the report underestimates this risk.

In the middle of this swirling controversy is the atomic veteran, his or her family and survivors. It is understandable that atomic veterans, their family members and survivors would be concerned about the illnesses related to exposure to ionizing radiation. These concerns are further compounded by frustration, mistrust, and anger due to the involuntary nature of their exposure to ionizing radiation, the secrecy surrounding the tests and the atomic veteran's level of exposure, and the lack of information (or conflicting information) about the chronic health effects due to their exposure to ionizing radiation.

Many mistrust the agency established to care for them -- the VA -- because it is part of the government, a government they perceive as covering up the true facts about the extent of their exposure and the adverse health effects associated with that exposure. While Congress has enacted a number of laws to provide atomic veterans with priority access to VA health care and VA disability compensation for their illnesses, diseases, and disabilities due to exposure to ionizing radiation, very few atomic veterans are able to access the VA health care system and receive adequate care and treatment. Even fewer atomic veterans and their survivors are able to establish entitlement to VA disability compensation benefits.

### ACCESS TO VA HEALTH CARE

Access to VA health care for atomic veterans is provided pursuant to title 38, United States Code, Section 1710, *et seq.* Public Law No. 104-110, 110 Stat. 768 (1996) extended the authority to provide priority health care for atomic veterans until December 31, 1996.

More than a quick review of the code, however, is needed to determine what type of care is provided and to whom. Under Section 1710(a)(1)(G): "the Secretary *shall* furnish hospital care, and *may* furnish nursing home care, which the Secretary *determines* is needed. . . to a veteran exposed to a toxic substance, radiation, or environmental hazard, as provided in subsection (e) of this section. . . ." (Emphasis added.) *See also* 38 C.F.R. § 17.47(a)(5).

Pursuant to Section 1710(e)(1)(B), ". . . a veteran. . . exposed. . . to ionizing radiation is eligible for hospital care and nursing home care. . . for *any* disability notwithstanding that there is insufficient medical evidence to conclude that such disability may be associated with such exposure." (Emphasis added.) However, "[h]ospital and nursing home care *may not* be provided. . . with respect to a disability that is found, in accordance with the guidelines issued by the Under Secretary of Health, to have resulted from a cause other than an exposure described in. . . paragraph (1) of this subsection." 38 U.S.C. 1710(e)(2).

The VA may also furnish outpatient care to an atomic veteran to prevent the need for hospitalization, to prepare for hospitalization, or for a condition for which the atomic veteran was hospitalized. An atomic veteran who is eligible for hospital care under Section 1710(a) may also qualify for outpatient treatment from the VA if he or she meets the annual income limitation

under 38 U.S.C. 1503. If those criteria are met, the VA must provide for outpatient medical care. See 38 U.S.C. § 1712 (a)(2)(B), 5(A), (B); 38 C.F.R. § 17.60 (b)(2), (c)(3).

Veterans claiming health conditions relative to radiation exposure are reportedly evaluated clinically by means of physical examination and diagnostic studies. The VA physician then makes the determination as to whether the condition resulted from a cause other than the specified exposure. Veterans who are not provided care under these conditions can still receive medical care if they are eligible under any other statutory authority.

Also available to the atomic veteran is the Ionizing Radiation Register mandated under Pub. L. No. 99-576 (1986), "Veterans Benefits Improvement and Health Care Authorization Act of 1986." It consists of physical examinations with access to supplemental data on compensation claims and radiation dose estimates.

On paper, these provisions appear to provide adequate access to medical care for atomic veterans. Yet, atomic veterans and their families believe otherwise. Some believe that the VA's sole emphasis is directed toward only those diseases that are recognized as "radiogenic diseases" and, if you do not have one of these disease, you are just wasting your time. There are also concerns that these physicians do not have a sufficient background in radiation diseases to properly diagnose their condition. They also believe that these physicians are concerned about encouraging compensation claims and, therefore, diagnose diseases other than those associated with radiation exposure, such as psychiatric problems or irritable bowel syndrome.

Are these problems real or perceptions based on a mistrust of the government? It is difficult to determine, but certainly, Congressional oversight is in order to ensure that atomic veterans are receiving adequate quality health care treatment.

### **VA DISABILITY COMPENSATION BENEFITS**

Prior to the enactment of the Veterans' Dioxin and Radiation Exposure Compensation Standards Act, Pub. L. No. 98-542, 98 stat. 2725 (1984) ("the Act"), the authority for 38 C.F.R. § 3.311 (formerly 38 C.F.R. § 3.311b), there was no legal limitation to establishing service connection for residuals of ionizing radiation exposure. Service connection for a disability is generally established when a veteran's present condition can be reasonably related to an injury or disease which is shown to be incurred coincident with service. See 38 C.F.R. § 3.303(a). Determination of service connection is based on a broad and liberal interpretation of the law consistent with the facts in each individual case. *Id.* It has long been the VA's policy that any condition which can be attributed to service shall be granted direct service connection, no matter how long after service the condition first became manifest. See 38 C.F.R. § 3.303(d). However, because of the difficulty in proving causation in ionizing radiation cases, and the significantly small number of claims which had been allowed, Congress, in 1984, recognized that, statistically, there was enough of an association between some diseases and radiation exposure to establish them as "radiogenic." Congress responded by enacting remedial legislation, the Act, whereby a veteran, suffering from a "radiogenic disease," was not required to submit evidence of causation.

During the debate in 1984 on the Act, Senator Cranston shared some figures with his colleagues which he believed demonstrated "very clearly a key source of frustration" felt by veterans and their survivors:

As of the present date. . .the VA has allowed no cases in which the veteran alleges exposure at Hiroshima or Nagasaki. Of the 1,646 claims related to exposure through participation in the nuclear testing program, a total of only 30 have been granted. . . .

The VA's track record. . . is as follows: 98% of all nuclear test-related cases have been denied; 97% of all nuclear test-related cases for malignancies have been denied; 88% -- about 100 -- of all nuclear test-related cases for leukemia -- as to which there is no question. . . of its link with exposure to ionizing radiation -- have been denied; as a whole,

taking into account the Hiroshima and Nagasaki occupation forces, the VA's record is even worse than those figures suggest.

130 Cong. Rec. S. 6147 (ed. daily. May 22, 1984).

Senator Cranston also stated: “. . . I believed, and I continue to believe, that the Government which exposed these veterans to this acknowledged health risk has a moral obligation to take responsive action to address their concerns.” *Id.* at S. 6145.

The stated purpose of the 1984 Act is “to ensure that [VA] disability compensation is provided to veterans who were exposed during service. . .to ionizing radiation. . .for all disabilities arising after service that are connected, based on sound scientific and medical evidence, to such service. . . .” The Act, § 3. Congress’s findings included: There is scientific and medical uncertainty regarding the long-term adverse health effects of exposure to ionizing radiation. *Id.* § 2(2). Due to the long latency period involved, radiation claims present adjudicatory issues which are significantly different from issues generally presented. *Id.* § 2(12). “It has always been the policy of the [VA] and is the policy of the United States, with respect to individual claims for service connection. . .that when, after consideration of all evidence and material of record, there is an approximate balance of positive and negative evidence. . .the benefit of the doubt in resolving each such issue shall be given to the claimant. *Id.* § 2 (13).

Presently, the VA recognizes 20 diseases as “radiogenic diseases” -- a disease that may be induced by ionizing radiation -- under § 3.311. These “radiogenic diseases” include leukemia, other than chronic lymphocytic leukemia; breast cancer; lung cancer; bone cancer; liver cancer; skin cancer; esophageal cancer; stomach cancer; colon cancer; pancreatic cancer; kidney cancer; urinary bladder cancer; salivary gland cancer; multiple myeloma; posterior subcapsular cataracts; non-malignant thyroid nodular disease; ovarian cancer; parathyroid adenoma; and tumors of the brain and central nervous system.

Pursuant to the provisions of 38 C.F.R. § 3.311, an atomic veteran diagnosed with a recognized “radiogenic disease” can have his or her claim for direct service connection for residuals of exposure to ionizing radiation adjudicated by the VA, notwithstanding the fact that the atomic veteran does not have any medical evidence to establish a cause and effect relationship between his exposure to ionizing radiation and his diagnosed “radiogenic disease.” Otherwise, (based on a recent court decision discussed *infra*) an atomic veteran who believes that his or her disability, not found on the list of “radiogenic diseases,” may have his or her claim for service connection on a direct basis adjudicated by the VA providing the atomic veteran has medical evidence to support the claim. Once the atomic veteran has demonstrated that he or she suffers from a “radiogenic disease” or provides medical evidence of a cause and effect relationship between his or her disability and exposure to ionizing radiation, the VA, pursuant to § 3.311 must obtain a dose estimate as to the range of doses to which the atomic veteran may have been exposed. Final review of direct service connection claims based on exposure to ionizing radiation is conducted by the Under Secretary for Benefits, who may obtain and consider any opinion of the Under Secretary for Health in reaching his determination whether the atomic veteran’s disease resulted from radiation exposure in service.

Mr. Chairman, although § 3.311 was passed by Congress in 1984 as remedial legislation, designed to assist atomic veterans and their survivors in obtaining compensation for illnesses, diseases, disabilities, and death due to exposure to ionizing radiation, this legislation has benefited very few atomic veterans or their survivors. Until recently, the VA considered the list of “radiogenic diseases” as an exclusive list thereby refusing to consider any claims for direct service connection for residuals of radiation exposure if the atomic veteran or his or her survivors could not demonstrate that the atomic veteran suffered from a listed “radiogenic disease,” regardless of the evidence submitted in support of the claim. The VA’s practice of adjudicating only those claims where the atomic veteran suffered from a recognized “radiogenic disease” was overturned by the United States Court of Appeals for the Federal Circuit on September 1, 1994, in *Combee vs. Brown*, 34 F.3d 1039, 1045 (Fed.Cir. 1994).

The *Combee* case is an excellent example of the seemingly insurmountable obstacles which face atomic veterans and their survivors in attempting to establish service connection on a

direct basis for residuals of exposure to ionizing radiation. Mr. Combee served in the United States Army during World War II and was part of the army of occupation of Japan serving in Nagasaki in 1945. As early as 1977, Mr. Combee's white blood cell differential count was abnormal. In July 1982, his platelet count was noted to be "very low" and a low white blood cell count with a "leukopenia" was also noted. In 1986, leukopenia and thrombocytopenia were diagnosed. In 1987, Dr. Russell, a VA physician in the immunology division, stated, "I believe it highly likely that this patient's inadequate bone marrow function which is causing his disability, is all due to his radiation exposure in 1945." Dr. Russell, in 1988, concluded, after having reexamined Mr. Combee, that "the only explanation for his condition is radiation exposure." Dr. Ballester, who examined Mr. Combee in 1989 at the University of South Florida, Department of Internal Medicine, Division of Hematology, stated that "[i]t is possible that his exposure to radiation has played a major role in the condition as this prolonged and severe leukopenia. . . with evidence of bone marrow damage and lack of white cell production could be the result of radiation exposure." In 1990, Dr. Berchelmann stated that Mr. Combee's disabilities was "explainable from long-standing marrow failure which can be caused by radiation exposure." Dr. Berchelmann went on to conclude his statement by indicating, "[i]t is my opinion that his leukopenia and thrombocytopenia can be due to radiation exposure."

It is interesting to note that as early as 1950, the 8th edition (1950) of the Merck Manual reported that "symptoms associated with anemia, leukopenia, and thrombocytopenia, appear" after months or years of chronic exposure to low-level doses of radiation. Leukopenia and thrombocytopenia continue to be listed in the 16th edition (1992) of the Merck Manual under delayed effects of prolonged or repeated exposure to low-dose rate from internal or external sources of radiation. Unfortunately for Mr. Combee, his claim for service connection for residuals of exposure to ionizing radiation was consistently denied by the VA at the agency of original jurisdiction and the Board of Veterans' Appeals, as well as at the United States Court of Veterans Appeals. After the United States Court of Appeals for the Federal Circuit reversed the lower court's decision and the VA's practice, Mr. Combee's case was remanded to the agency of original jurisdiction for further adjudication. Like so many other atomic veterans, Mr. Combee succumbed to his disabilities before his claim could properly be adjudicated on the merits.

Once an atomic veteran seeking direct service connection for residuals of exposure to ionizing radiation has established that he or she suffers from a recognized "radiogenic disease" or has provided the VA with medical evidence of a cause and effect relationship, the burden of proof then shifts to the VA for consideration of the case on the merits. It is at this point that atomic veterans face their greatest obstacle in establishing their entitlement to service connection. Dose estimates and dose reconstruction data for the various radiation tests are handled by the Defense Nuclear Agency.

In more cases than not, no actual individual exposure record is available for the atomic veteran, and reconstructed dose estimates routinely fail to provide an accurate estimation of the level of radiation exposure experienced by the atomic veteran. Film badges, not issued to all participants in nuclear tests, did not provide a complete measure of radiation exposure, since they were not capable of recording inhaled, ingested, or neutron doses, or often shielded during the detonation, and were worn for only limited periods during and after each nuclear detonation.

Many atomic veterans who participated in the nuclear tests in the Pacific report visiting these islands a short time after the test detonation and eating locally grown fruits and swimming in the lagoons. Atomic veterans who participated in the Nevada test sites report being covered in fallout dust which was either brushed off of them by hand or with brooms. Many report being transported to mess halls shortly after walking through "ground zero" and not being able to properly clean themselves before eating. These factors are extremely important in determining a proper reconstructed dose estimate; however, it does not appear that the participant's comments are used to further the analysis with regards to the dose reconstruction estimate. Without accurate reconstructed dose estimates, atomic veterans and their survivors find it virtually impossible to obtain the benefits they seek.

All too often, reconstructed dose estimates show that the overwhelming majority of participants were supposedly exposed to one rem or less of external doses of ionizing radiation. It is extremely difficult to believe, based on the statements made by participants, that their total

exposure was so minimal. The DAV believes that a great injustice has been done to America's atomic veterans and their survivors. As will be discussed later, only ten percent of those atomic veterans who seek compensation for their residual disabilities are granted service-connected benefits, although the VA cautions that "[i]t cannot be inferred from this number that service connection was necessarily granted on the basis of radiation exposure." In other words, although the atomic veteran claimed residual disability as a result of his exposure to ionizing radiation, the claim could have been allowed under general principles establishing service connection such as the disease or illness was evidenced in the service medical records, etc..

It cannot be overemphasized that radiation claims are wrongfully denied because of inaccurate reconstructed dose estimates used as the basis for the determination that the estimated minimal level of exposure experienced by the atomic veteran was insufficient to cause the cancer or other disease ravishing the atomic veteran's body. The reality is that atomic veterans are fighting a losing battle, not only with the disease or diseases that have taken away their good health, but with the very government that put them in harm's way.

An example of such a case is that of a deceased atomic veteran, Michael W. Stanko, who died in 1985. Mr. Stanko's claim for residuals of radiation exposure and his widow's claims have been before the VA for 17 years, and was recently remanded to the Board of Veterans' Appeals by the United States Court of Veterans Appeals. After her husband's death, Mrs. Stanko pursued the claim, in her own right, for survivor's benefits. Although Mr. Stanko's claim had been denied, in part, due to minimal exposure to ionizing radiation, a postmortem plutonium study performed on Michael Stanko showed a 98 rem bone dose, 33 rem lung dose, and 7.5 rem ingested dose. It is extremely difficult to understand why this claim has not been successfully resolved long before now.

Adjudication of radiation claims pursuant to 38 C.F.R. 3.311 have been a total failure. With almost 95% of atomic veterans failing to establish service connection for their illness, disease, or disability, the remedial legislation passed in 1984 has not provided atomic veterans with meaningful consideration of their claims. The present statistical data showing an extremely high denial rate has changed very little since 1984 when former Senator Cranston expressed the need for this remedial legislation.

In May 1988, aware that something more was needed, Congress passed Pub. L. No. 100-321, § 2(a), 102 Stat. 485, which grants service connection on a presumptive basis for certain diseases becoming manifest in an atomic veteran to a degree of 10% or more. Currently, the list of presumptive diseases, a total of 15 in all, include: leukemia, other than chronic lymphocytic leukemia; thyroid cancer; breast cancer; cancer of the pharynx; esophageal cancer; stomach cancer; cancer of the small intestine; pancreatic cancer; multiple myeloma; lymphomas, except Hodgkin's disease; bile duct cancer; gall bladder cancer; primary liver cancer, except if cirrhosis or hepatitis B is indicated; salivary gland cancer; and urinary tract cancer. While 20 diseases are recognized as "radiogenic diseases" pursuant to 38 C.F.R. § 3.311, only 15 diseases are presumed to be service-connected as a result of exposure to ionizing radiation. Yet, pursuant to the Marshall Islands Nuclear Claims Tribunal Act, 25 separate medical conditions are irrefutably presumed to be the result of radiation exposure and Marshall Islanders are compensated for these disabilities. It is difficult to understand the lack of consistency in these lists. Why are only 15 diseases given a rebuttable presumption of service connection for atomic veterans while Marshall Islanders receive an irrefutable presumption for 25 medical conditions? Further, at the very least, why are not all 20 "radiogenic diseases" presumed to be service-connected as a result of ionizing radiation exposure pursuant to 38 U.S.C. 1112(c)? Why does our government continue to put the needs of its veterans behind those of other groups, such as the Marshall Islanders? America's veterans should always be considered a special and unique group for having served their nation with honor.

The Defense Nuclear Agency has identified 222,968 participants of the U.S. Atmospheric Nuclear Tests (personnel who attended more than one test series are counted more than once.) Approximately 150,458 participants were involved in the nine tests which took place in the Pacific. Almost 68,000 participants were involved in the nine tests in Nevada, and more than 4,500 participants participated in the Atlantic test. As of April 1, 1996, VA statistics show that there have been a total of 18,515 radiation cases. Service connection has been granted, as of

April 1, in 1,886 cases. Again, it is important to note that the VA states that it cannot be inferred from this number that service connection was necessarily granted on the basis of radiation exposure. Statistics current as of December 1, 1995, demonstrate that of the total number of cases in which atomic veterans have been granted service connection, 463 involve the granting of presumptive service connection pursuant to § 1112(c).

Something is seriously wrong with this process if atomic veterans, such as Mr. Combee and Mr. Stanko, are continuously denied service connection for the residuals of radiation exposure when the evidence clearly warrants an allowance in those cases. Atomic veterans have waited too long to receive, not only the recognition they so richly deserve for their dedication to duty, but also the services and benefits to which they are entitled.

Congress should consider making all the recognized "radiogenic diseases," and any other disease, illness, or disability that others, such as the Marshall Islanders, are being compensated for, with those diseases for which presumptive service connection is granted. The Marshall Islanders have an irrebuttable presumption, at the very least, America's atomic veterans should receive a rebuttable presumption for all diseases, illnesses or disabilities for which others are compensated.

The DAV commends this subcommittee for its recent, favorable action on adding bronchiolo-alveolar carcinoma, a form of lung cancer, to the list of diseases presumed to be service-connected for veterans exposed to ionizing radiation. As stated above, however, all recognized "radiogenic diseases" including lung cancer should be added to the list of diseases presumed to be service-connected.

While we note that these new benefits would come under the "pay-go" provisions of the Budget Enforcement Act, it appalls us to think that in order to pay for the provisions of this new legislation, some other worthy program or group of wartime disabled veterans or their dependents will have to give up their compensation to fund new legislation to benefit atomic veterans. Congress must realize that paying for disabilities of wartime disabled veterans is nothing more than an extension of the costs of the war waged by our government. In the case of atomic veterans, their disabilities not only stem from our wartime actions, but also from our government's desire to learn of the effects of radiation exposure in the event of future nuclear wars.

It is unconscionable to think that one worthy group of wartime disabled veterans must give up an entitlement so that another worthy group of wartime disabled veterans can receive benefits or services to which they are entitled. "Pay-go" provisions should not be applied to benefits or services affecting wartime disabled veterans.

The DAV calls upon Congress to correct this injustice and to provide an exemption to "pay-go" provision of the Budget Enforcement Act when new benefits are provided to wartime disabled veterans.

In closing, I would like to refer to a phrase which appears on the *Atomic Veterans'* Newsletter, published by the National Association of Atomic Veterans, Inc. that states: "The atomic veteran seeks no special favor. . . simply justice." This justice is long overdue. DAV encourages this subcommittee to do everything necessary to ensure that this group of forgotten veterans -- atomic veterans -- receive meaningful justice from our government.

This concludes my statement. I would be happy to answer any questions you may have.

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 NATIONAL ASSOCIATION OF ATOMIC VETERANS
 

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April 30, 1996

STATEMENT OF  
 PAT BROUDY, LEGISLATIVE DIRECTOR  
 OF  
 THE NATIONAL ASSOCIATION OF ATOMIC VETERANS  
 BEFORE THE SUBCOMMITTEE ON COMPENSATION, PENSION,  
 INSURANCE  
 AND MEMORIAL AFFAIRS  
 OF THE COMMITTEE ON VETERANS' AFFAIRS  
 U. S. HOUSE OF REPRESENTATIVES

Mr. Chairman and Members of the Committee:

As Legislative Director of the National Association of Atomic Veterans (NAAV), I have been requested to provide testimony to this Committee with regard to access to treatment and compensation for veterans exposed to ionizing radiation and the effects of exposure to this environmental hazard. Thank you for allowing us to express our views.

**Access to treatment**

The issue of access to treatment continues to be a very thorny subject with our veterans. Because most of our veterans do not have access to a VA treatment center or hospital because of distance, inability to drive, and other problems, there is no possibility they can take advantage of the VA facilities. Even those who do have the ability to use those facilities, find the long drives, the long waits and the demeaning attitudes of some of the personnel, impossible to contend with in their weakened conditions. We must "sweat it out" each year to determine if we are considered on the priority list, along with Gulf War and Agent Orange veterans. My suggestion as a remedy for this situation would be to allow these veterans use of the "CHAMPVA" program, or a military medical facility if one is available in his area. Because the DIC widows have access to this system, it is reasonable to include those veterans who do not have access to VA facilities, the same advantage. A supplemental policy should be in place for those taking part in the program, so that there is no out-of-pocket expense to them.

**Compensation for veterans exposed to ionizing radiation, and their survivors.**

During her first "Openness" press conference in October 1995, the Honorable Hazel O'Leary asked me what it was the atomic veterans were most concerned about. I told her that in order to prove a claim before the Department of Veterans Affairs (VA), we must have medical and service records, which we felt had been classified and/or destroyed by the VA, Defense Nuclear Agency (DNA), Department of Defense (DoD)

and Department of Energy (DoE). Subsequent to that request I received copies of letters from the Secretary addressed to Major General Gary Curtin, USAF, Director of the Defense Nuclear Agency; the Honorable Jesse Brown, Secretary of Veterans Affairs, and the Honorable William J. Perry, Secretary of Defense, requesting their cooperation in producing the records referred to.

Recently I received a letter from the Honorable Jesse Brown, Department of Veterans Affairs (VA), March 19, in which he assured me he was committed to helping atomic veterans. He stated he was participating in the VA-DoD Partnership Agreement, working in tandem with DoD to declassify any military records that might identify a veteran's exposure to ionizing radiation. He also stated that he had established the VA Human Radiation Interagency Working Group that was working with DoD and the Department of Health and Human Services to address the adequacy of all laws and regulations to compensate atomic veterans. So far I have not heard anything regarding this effort.

A letter from Major General Gary Curtin, Director, Defense Nuclear Agency (DNA), also in response to Honorable Hazel O'Leary's query of January 2, stated that he had written to the individual military organizations responsible for records management, requesting they provide him written information about the existence of classified service and medical records of atomic veterans, and to inform him of their efforts to declassify such records and make them available to atomic veterans. He stated he would notify me of the results of these records' reviews "as soon as we receive responses to our requests." He then listed the addresses of the Navy, Marine Corps, Air Force and Army where such records may be requested by the atomic veterans. At this time I have not received any further communication from the two gentlemen regarding this issue. The Honorable William J. Perry, Secretary of Defense, was written the same letter as the VA and DNA. He has not responded as of the composition of this testimony.

Secretary Jesse Brown mentioned in his letter he was working with other agencies "to address among other things the adequacy of our laws and regulations to compensate atomic veterans." In August of 1993 the Secretary had a golden opportunity to do just that. Three atomic veterans' organizations' representatives wrote him a joint letter requesting he use his rule-making authority to amend the regulations that implement the legislative laws, P.L. 100-321 and 102-578 (presumptive laws).

Additions to the presumptive laws enacted by Congress to liberalize the strict standards of the 1984 Act (P.L. 98-542), have only been made by Congress to date, although there are examples of the Secretary's use of his rule-making authority, i.e., adding presumptions to the mustard gas, POW, and Agent Orange veterans' entitlements, as well as adding foreign country nuclear tests participated in by our veterans, to the presumptions in the atomic veterans' presumptive laws.

The Advisory Committee on Human Radiation Experiments (ACHRE) on page 812 of its Report and Recommendations to the Human Radiation Interagency Working Group, requested that Group to review whether existing laws governing the compensation

of atomic veterans are now administered in ways that best balance allocation of resources between financial compensation to eligible atomic veterans and administrative costs, including the costs and scientific credibility of dose reconstruction.

The Committee found that the government did not maintain adequate records of all veteran participants...the Committee urged the Working Group in conjunction with Congress to address the concerns promptly. There are five concerns listed; in which we concur. I would like to address the last one (#5), in detail. It asks: [If] the time and money spent on contractors and consultants in administering the program would be better spent on directly aiding veterans and their survivors. Our answer is a resounding "Yes!"

A letter from the Secretary of Veterans Affairs to Sen. John D. Rockefeller dated July 18, 1994 states: 414 out of 15,818 claims were granted on a presumptive basis. (P.L. 100-321 amended by 102-578). These did not need dose reconstructions. We have tried to obtain the number of claims granted under P.L. 98-542 which requires dose reconstructions. We have been unable to obtain this information from the VA. (As of the end of September 1991 over 12,000 claims had been received for disability or death alleged to have resulted from exposure to ionizing radiation under both P.L. 100-321 and P.L. 98-542. 258 were granted, 167 of whom were survivors. Twenty-five veterans were rated at 0 percent.) I mention this only to illustrate what our veterans and widows have been struggling with. Out of over 200,000 veterans exposed to ionizing radiation the above statistics deserve immediate correction by Congress. Today I was informed by VBA, VA Central Office, Washington that as of January 1, 1996, 463 Claims have been awarded under the presumptive laws out of 18,515 adjudicated. There was no breakdown as in the 1991 testimony. That is 49 more awards than the 1994 number. The Secretary of Veterans Affairs in his letter of July 18, 1994 to The Honorable John D. Rockefeller stated that as of May 1, 1988, "all claims involving atmospheric testing or the occupation of Hiroshima and Nagasaki are considered under both laws [P.L. 98-542 and P.L. 100-321 amended by 102-578]." If that is the case then today's message from Washington tells me that of the 463 veterans receiving compensation, *some of them* must have been awarded under P.L. 98-542? In the Secretary's 1994 letter he states, "Our records also show that service connection on a presumptive basis was granted in 414 cases." Does this mean that there were none granted under P.L. 98-542, since he said that all claims since May 1, 1988 were considered under both laws? I'm a little confused here. So why do we need P.L. 98-542?

The contractor for the DNA NTPR program, Science Applications International Corporation (SAIC) charges \$3,000 for each dose reconstruction. The DNA costs for Nuclear Test Personnel Review (NTPR) dose reconstructions for the period 1978 to 1994 is \$13,598,939; the total funding for the Nuclear Test Personnel Review Program for that same period is \$96,500,000. We do not know what "total funding" encompasses. The total is \$110,098,939.

I have sent a Freedom of Information Act request to the DNA "for all other costs of that program, including complete costs for the NTPR and UNTPR (Underground Nuclear Test Personnel Review) programs from their inception, up to and including January 31, 1996, excluding the dose reconstruction contract costs already received.

These costs should include, but not be limited to, the funds expended by each Service team and money each contributed to the Defense Nuclear Agency for the programs and the DNA field command team; funds expended by DNA for its contractor services, including dose reconstruction costs not previously provided; all salaries, bonuses, or any other remuneration paid to employees of DNA, DoE, DoD, contractors and subcontractors in performance of their duties regarding the programs. Data base efforts; DNA correspondence, and funding provided to the Department of Energy for its support of the NTPR and UNTPR programs must be provided.

"Please include funding for JRB Company, a subsidiary of Science Applications International Corporation (SAIC), and G.E. Tempo, later Kaman Tempo, contracted to write histories of DNA's participation in atmospheric tests on the Continent and in the Pacific and Atlantic respectively. Funding for research and reports, such as by the University of Utah, the National Academy of Sciences, Centers for Disease Control, GAO, also should be included, as well as funding provided to the DoE for Reynolds Electric and Engineering Company (REECo) NTPR and UNTPR support and any other supporting agency, and DNA administrative costs for the NTPR and UNTPR programs."

When I receive the requested information I will furnish it to both Houses of Congress Veterans Affairs Committees, as well as the President. It would be interesting to see how much of the hundreds of millions and perhaps billions of taxpayers' dollars have been spent on compensation of a few sick old men and their survivors, and the denial of benefits to many others. Millions have been spent alone, on Department of Justice defense of lawsuits filed against the government, because of various deaths and injuries of military and civilians exposed to ionizing radiation, generating new laws to protect the government, i.e., the "Warner Amendment." I wonder how much we paid the Japanese government for loss of life and fish in the "Lucky Dragon" incident because of Test Bravo of Operation Castle. How much have we spent compensating and providing medical care for the natives of the Marshall Islands, while denying compensation and medical care to our own veterans exposed during that same Bravo fiasco?

On the subject of compensation, please take into consideration the survivors left to bear the burden of caring for the dying, and the fatherless children, left with maybe only one parent, or maybe none.

I would like to speak to the issue of wives and widows in particular. I speak with at least one widow a day, mostly those left with no means of support and staggering medical costs for the care of their spouse during his last illness; the widows of atomic veterans who do not have the wherewithal to pay for dose reconstructions, and to prosecute a claim. And even if they qualify under the presumptive laws, their meager \$800 a month does little to pick up the slack. These women must bear the pain of nursing and then losing a spouse to a horrible, lingering death. They then must pick up the pieces, perhaps sell their homes to pay medical bills and educate their children, or the children must leave school because of lack of funds. The issue of whether their husbands were the victims of "medical and scientific experimentation" is a millstone around their necks. How could our government do that to these patriotic Americans? There's no

medical records and the damning documents are buried by the DoD and other agencies. Although the Committee seems to feel that the atomic veterans were not as experimented upon as those injected with plutonium or fed uranium--what do you consider an injection or ingestion of radionuclides? Does the wind swirling about your face filled with plutonium and other alpha emitters unmeasurable on a film badge constitute an injection? These men were inhaling or ingesting these poisons, and although they were not miners and exposed to radon, nor did they have a syringe of plutonium injected into their bodies--what is the difference? It only takes one micron of plutonium to give a full-blown lung cancer. That little tiny speck if inhaled, will settle in the alveolar lung sac or the mediastinal lymph nodes and become a ticking time bomb--perhaps in 15 or 20 years the victim develops lung cancer, lymphoma or other cancers, however, lung cancer for the atomic veteran is impossible to prove. It's okay if you're a miner, but not if you're a veteran.

Full 100 percent disability compensation must be awarded the remaining atomic veterans as well as complete medical care for any illness. When he dies, his widow must have a lump sum benefit sufficient to pay all bills connected with the veteran's last illness of at least \$100,000 with no offsets for Social Security, VA benefits or other governmental payments with respect to the veteran's disability. The children's full tuition at a college or university of his/her choice until age 26 must be provided. In addition to the lump sum benefit, the widow must receive her husband's full disability so that she is in no danger of losing her home. This applies also to widows currently receiving VA DIC benefits. All benefits to be retroactive to date of first filing of claims for benefits. This is a small price to pay when compared to the staggering costs of all the expenses of the studies, NTPR, UNTPR, maintaining secrecy, hiring contractors to accomplish questionable dose reconstructions, and all other expenses as outlined above.

#### **Governmental secrecy and its effects on veterans/survivors**

We have maintained throughout the years, but have been unable to prove, that the government has kept two sets of medical and service records of the atomic veterans. I list below some of the documents uncovered recently:

1. Current Directives - Subject: Safety Regulations for work in Target Vessels formerly JTF-1, BUREAU OF MEDICINE AND SURGERY, EN10/Radsafe, Washington, D.C. 31 January 1947, Page B-22:

6. PRE-EXAMINATION. All personnel, both military and civilian, who may be exposed to radiation or radioactive hazard, will be required to have a complete physical examination prior to commencing such duty. Special medical records separate from the normal individuals' health records will be set up and they will be classified as confidential until declassification is permitted...

Page C-2 3.52. Internal Radiation. No amount of plutonium or a similar alpha emitting element is ever considered tolerable... A total of one microgram of plutonium or a similar element deposited in the body is considered a lifetime tolerance.

Page C-6. The original copies of all papers for each person examined will be firmly fastened together and will be forwarded to the Atomic Defense Division, Code 74, Bureau of Medicine and Surgery... The duplicate of each examination will likewise be securely fastened and filed at the local Radiological Health Headquarters...one additional copy of the completed examination to the Atomic Defense Division Code 74...A statement that a special radiation examination was given as provided in this publication shall be entered in the corresponding person's health record...An abstract of the examination will be entered in the special Radiation Abstract of the Health Record...These abstracts are to remain in each Health Record for the duration of service of all personnel involved.

2. REPORT OF CONTACT from VARO 344 7-11-77  
 "When all this information is assimilated, a call needs to be made to Fred so that they can help get the radiation records which are kept in a separate place...he can assist us with obtaining the radiation exposure records...In addition, in the ( ) case, supplemental 3101 should be released." (VA Form 119)
3. HOSPITAL CORPSMAN 1 & C, BUREAU OF NAVAL PERSONNEL NAVY TRAINING COURSE NAVPERS 10670, page 260. Record of Exposure to Ionizing Radiation (DD-1141) The form is used to record exposure of all personnel who:
  1. Work in a radioactive environment
  2. Enter a radioactive area
  3. Are exposed to ionizing radiation
  4. Are exposed to nuclear explosions

The DD-1141 shall be initiated when military personnel are first exposed to ionizing radiation; thereafter, it becomes a permanent part of the member's health record. (None of the atomic veterans I have spoken to have found this form in their medical file, if they could find their medical file.

#### 4. CHAPTER 2. IONIZING RADIATION REGISTRY EXAMINATION

The purpose of this chapter is to outline clinical and administrative policies related to the maintenance of VHA's (Veterans Health Administration's) IRR (Ionizing Radiation Registry) program of physical examinations for concerned veterans.

Public Law 99-576 "Veterans Benefits Improvement and Health Care Authorization Act of 1986," enacted October 28, 1986, mandated the Secretary of the Department of Veterans Affairs to establish and maintain an Ionizing Radiation Register of atomic veterans.

- a. The IRR will consist of physical examinations with access to supplemental data on compensation claims and radiation doses from VBA (Veterans Benefits

Administration) and DNA (Defense Nuclear Agency) of DOD (Department of Defense) respectively. VA shall compile and consolidate all pertinent information maintained by relevant elements of VA or DOD. According to the DNA, over 200,000 test participants have been identified as to their specific involvement and their recorded radiation exposure. As of April 18, 1996 there are 20,351 veterans on the Ionizing Registry.

**Pre-examination activities**

(4) CHR (Consolidated Health Record). Establish a CHR if one does not already exist. VA Form 10-1079, Emergency Medical Identification, should be affixed to the front of the record and the word "RADIATION" circled. Any veteran claiming exposure to ionizing radiation and all veterans participating in the registry should have VA Form 10-1079 affixed to the front of the CHR.

I quote verbatim the following:

**Code Sheet Completion (5)**

(a) The IRC or designee will complete Part I of VA Form 10-0020A, Ionizing Radiation Registry Code Sheet, and will ensure that all information has been provided before the veteran is referred to the clinician for examination.

(b) The EP will complete Part II of VA Form 10-0020A. To further ensure the form's completeness, the clinical examiner will review it and, if necessary, enter missing items at the veteran's direction. In addition, the EP will inquire whether any of the veteran's natural children or grandchildren have any birth defects, and will so note in Item 20 "Remarks" section of the code sheet and in the CHR... (Emphasis added.)

**Post-Examination Activities**

Upon completion of the physical examination, the EP or designee will personally discuss with each veteran the results of the examination and the available laboratory results. This personal interview will be conducted in such a way as to encourage the veteran to discuss any exposure related health concerns, as well as those of family members. This information will be documented in the veteran's CHR. (Emphasis added.)

**Reporting Requirements**

(2) Send one legible copy only, file the original in veteran's CHR. (Emphasis added.)

**RECORDS CONTROL, DISPOSITION AND RETENTION**

**a. Records Control**

- (5) The code sheet will be prepared with one copy.
- (b) The legible copy sent to the EAS in VA Central Office.

**b. Records Disposition**

- (1) Copies of code sheet retained at the facility should be held for 1 year.
- (2) Disposal of these code sheets, after one year will be in accordance with policy established at the local level (i.e., burning, shredding, etc.).

**c. Records Retention.** Ionizing radiation examination information will be made part of the perpetual medical record at medical facilities for 75 years after the last episode of care. This includes:

- (1) VA Form 10-0020A, Ionizing Radiation Registry Code Sheet,
- (2) Progress notes,
- (3) Laboratory reports,
- (4) Patient locator cards,
- (5) X-rays, and
- (6) Any other documentation that may have been part of a radiation examination.

**INSTRUCTIONS FOR COMPLETING VA FORM 10-0020A IONIZING  
RADIATION REGISTRY CODE SHEET, AND A COMPLETED  
SAMPLE OF VA FORM 10-0020A**

1. **GENERAL.** An original code sheet will be prepared in accordance with the following instructions:

c. The original code sheet should be filed in the CHR (Consolidated Health Report) and one legible copy sent to the IRC (115A), EAS (Environmental Agents service), Washington, DC. Additional follow-up examinations, as required, will be documented in the CHR, and will only be submitted to the EAS when there is a change to veterans health status, i.e., Item 17 regarding birth defects, Item 19 "Radiogenic Related Disease(s),"...

**3. Section II - Items 17 through 22 will be completed by Examining Physician**  
**a. Is there Evidence of Birth Defects Among Veteran's Children?**

Enter appropriate code in block. If yes, enter "1," note in Item 20 "Remarks" section with specific information (e.g., daughter - Down's Syndrome, grandson - cleft palate, etc.); Enter "2" if no and "3" if unknown. As of 4-18-96 the VBA, VA Central Office, Washington, faxed this statement to me: "Our registry data show 783 veterans responded 'yes' to this question." The VA did not identify the numbers or types of birth defects.

The last page of this document, M-10, Part II, Chapter 2 APPENDIX 2C, March 30, 1992, page 22, is a very poor copy of the Ionizing Radiation Registry Code Sheet with the Veterans Administration Logo at the top. The first subheading states: "Obtain this information from patient's chart only;" under that is "Section 1. To be completed by medical administration." Identification of the veteran follows. The second subheading, states: To be Completed by Examining Physician or Program Coordinator. Number 17 of the form states: "Is there evidence of birth defects among veteran's children or grandchildren? (See above paragraph.)"

From the above I conclude that the VA/DNA/DOD has had a registry of veterans, their illnesses, and the mutagenic effects of their children since 1986. That being the case, why wasn't that information used for the National Academy of Sciences (NAS) Feasibility Study? They had access to the total numbers and types of defects, while only stating to me that 783 veterans answered "yes" to 17. At this point we feel the VA has committed fraud upon those veterans and their children. I say that because the negative feasibility study of our offspring by the National Academy of Sciences has denied us the

epidemiologic study we have requested over the years of those children. At this time, and particularly because there is a contemplated study funded in part by the VA of the Agent Orange children for spina bifida occurrences in that population, we demand equal consideration of our offspring, and not for just spina bifida. Enclosed is our latest data base printout of our children and grandchildren and their mutagenic illnesses. Of 620 veterans reporting with a total number of children of 1,977 there are 1,178 birth defects not counting 588 miscarriages, still births/early deaths, live births with serious genetic defects and premature births. Total number of veterans reporting grandchildren, 396, total number of grandchildren, 1961 with a total of 393 birth defects and 293 others. We also have a few great-grandchildren with birth defects.

### **RECOMMENDATIONS OF THE NATIONAL ASSOCIATION OF ATOMIC VETERANS**

1. All radiation victims be compensated for the same radiogenic illnesses and in the same amount--regardless of site of exposure and that all such illnesses be presumptive.
2. That all classified service and medical records of atomic veterans be immediately declassified.
3. The 11 other additional radiation risk activities revealed by the Veterans Affairs Committee on Environmental Hazards, August 1993, be included for consideration in the existing laws and any future laws pertaining to atomic veterans, without time constraints since that list was limited to a cutoff date of 1970.
4. That the radioepidemiological tables be eliminated as a source of reliance by the VA in determining a veteran's/survivor's entitlement to service connection benefits.
5. We recommend that all veterans/survivors covered under RECA be awarded the highest sum (\$100,000) now awarded only to uranium miners, with no offsets or restrictions and that all the radiogenic illnesses listed below be added to the RECA law.
6. After all these radiogenic illnesses: lung, bone, colon, prostate, parathyroid cancers and posterior subcapsular cataracts, nonmalignant thyroid nodular disease, brain and central nervous system tumors (this includes Meningioma), unexplained bone marrow failure and diabetes have been added to the presumptive laws, that P.L. 98-542 be repealed in its entirety. That any illnesses determined by an independent non-governmental medical institution agreeable to both parties to be radiogenic, shall be added to the presumptive list as well as RECA.
7. That survivors of atomic veterans, be awarded monetary sums expended by the survivors for the care, treatment, hospitalization, loss of earnings and other expenses of the veterans final illness in the amount of \$100,000, if the veteran died of a disability as listed in P.L. 100-321, 102-578 or any illness listed in 6. above, or any illness found to be radiogenic in the future. That this remuneration (as suggested in the Report of the Advisory Committee) be in addition to DIC (survivors' benefits) and not subject to any other offset for Social Security benefits or other governmental benefits received as a result of the veteran's illness. Priority care in VA hospitals must be on a continuing basis and not subject to yearly renewal.

8. Onsite presence at a test site, or any other proximity to ionizing radiation will be presumed for compensation purposes in the absence of evidence to the contrary.

9. That the registry of birth defects of offspring of atomic veterans outlined in VA Form 10-0020A and those offspring of atomic veterans listed in the NAAV data base, attached, and any future birth defect offspring data of atomic veterans, be made available to an independent, nongovernmental agency or group of independent epidemiologists for an honest study to be accomplished in the near future, paid for by the government, and that in the meantime, compensation for their care and treatment be awarded those offspring or their guardians.

10. That all claims awarded by the VA be retroactive to date of first filing of claim including those currently receiving benefits, without the necessity of refiling .

#### **Savings to the Department of Veterans Affairs**

We are aware that the addition of those cancers and illnesses listed in 6. above could theoretically create an additional financial burden on the Department. However, Congress has already appropriated substantial sums for payment of claims under all laws pertaining to atomic veterans. Given the pitiful number of claims awarded under the presumptive laws (less than 500), we believe there should be no added expense to the Department. Most of the claims granted are paid to widows at a much reduced rate from that paid the veteran. Benefits paid to terminally ill veterans will probably only be paid for a short time, given the nature of their disease. Congress, in order to offset any possible expense could repeal P.L. 98-542, thereby eliminating the necessity of the expenditure of moneys for dose reconstructions by the DNA and its contractors as well as all the other expenses connected thereto.

Eliminating the expense of dose reconstructions would free up funds for use in the independent, nongovernmental study of the offspring of the atomic veterans who suffer from mutagenic problems, and compensation to those afflicted, or their guardians, for their care.

# National Association of Atomic Veterans

Date: 4/11/96



**Total Number of Atomic Veterans Reporting: 620**

**Total Number of Children Reported: 1977**

## Births:

Miscariages:	238
Still Births/Early Deaths	156
Live Births with Serious Genetic Defects	151
Premature Births:	43

## Congenital Defects:

Internal Organs:	73
Appendages:	2
Bone (Inc. Skull):	118
Heart:	67
Blood:	67

## Other:

Neoplasms (Cancers, Tumors):	120
Mental Retardation:	88
Cerebral Palsy:	28
Epilepsy:	25
Eye Problems:	72
Deafness:	43
Sterility:	36
Psychiatric Illness:	63
Spina Bifida:	4
Diabetics:	17
Multiple Sclerosis:	11

## Miscellaneous:

Respiratory, Muscle, Teeth, Skin:	246
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Note: Many children had more than one defect

Prepared by Rudy Florentine, chairman of the genetically affected children project of the Atomic Veterans

# National Association of Atomic Veterans

Date:4/11/96



**Total Number of Atomic Veterans Reporting: 396**

**Total Number of Grandchildren Reported: 1961**

## Births:

Miscarriages:	138
Still Births/Early Deaths	38
Live Births with Serious Genetic Defects	85
Premature Births:	32

## Congenital Defects:

Internal Organs:	22
Appendages:	3
Bone (Inc. Skull):	24
Heart:	20
Blood:	8

## Other:

Neoplasms (Cancers, Tumors):	25
Mental Retardation:	44
Cerebral Palsy:	3
Epilepsy:	8
Eye Problems:	32
Deafness:	25
Sterility:	3
Psychiatric Illness:	31
Spina Bifida:	3
Diabetics:	8
Multiple Sclerosis:	0

## Miscellaneous:

Respratory, Muscle, Teeth, Skin:	134
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**Note:** Many grandchildren had more than one defect

Prepared by Rudy Florentine, chairman of the genetically affected children project of the Atomic Veterans



Defense Nuclear Agency  
6801 Telegraph Road  
Alexandria, Virginia 22310-3398

MAR 3 1995

Mrs. Patricia Broudy  
Legislative Director  
National Association of Atomic Veterans  
3342 Periwinkle Drive  
Monarch Beach, California 92629

Dear Mrs. Broudy:

I am forwarding to you the historical dose reconstruction contracts which, I indicated in my 3 February 1995 letter, would be retrieved from archival storage and copied for you. You will find copies of eight contracts attached and identified as follows:

DNA001-80-C-0378  
DNA001-82-C-0012  
DNA001-83-C-0039  
DNA001-84-C-0097  
DNA001-84-C-0351  
DNA001-85-C-0101  
DNA001-87-C-0004  
DNA001-89-C-0096

The archival search encompassed locating ten contracts. However, only the eight listed above survive. Two of the contracts, DNA001-78-C-0186 and DNA001-80-C-0052, the oldest of the ten, are no longer available. They were destroyed at the Suitland, Maryland Federal Records Center in December 1988 and January 1991, respectively, according to the Federal Acquisition Regulations (FAR), which specify a schedule for the destruction of contracts after closeout. The total costs and periods of performance, summarized in my 3 February 1995 letter, are accurate representations for these destroyed contracts because summary abstracts for these Defense Nuclear Agency contracts (copies attached) are retained on file.

I hope the attached contracts provide you useful information. Please contact me if I can be of further assistance.

Sincerely,

*George W. Hagemann*  
for KENNETH L. HAGEMANN  
Major General, USAF  
Director

Attachments  
as stated

**Total Funding for the Nuclear Test Personnel Review Program  
(1978 - 1994)\***

<u>Fiscal Year</u>	<u>Funding (\$M)**</u>
78	3.9
79	7.6
80	10.7
81	10.0
82	9.5
83	5.8
84	3.9
85	3.6
86	3.2
87	3.8
88	3.3
89	4.0
90	4.2
91	4.5
92	4.2
93	4.8
<u>94</u>	<u>9.5</u>
<b>Total</b>	<b>96.5</b>

\* Source: NTPR *"For the Record - A History of the Nuclear Test Personnel Review Program, 1978 - 1993"*;  
final draft of DNA 6041 F

\*\* Then year dollars

## DNA Costs for NTPR Dose Reconstruction

<u>Contract Number</u>	<u>Period of Performance</u>	<u>Contract Value (\$)</u>
DNA001-78-C-0186	2/27/78 - 6/16/80	545,790
DNA001-80-C-0052	3/ 1/80 - 10/20/82	1,925,673
DNA001-80-C-0378	9/29/80 - 6/25/86	973,378
DNA001-82-C-0012	11/ 2/81 - 10/31/83	918,638
DNA001-83-C-0039	1/ 1/83 - 10/ 1/85	1,037,000
DNA001-84-C-0097	1/11/84 - 6/16/86	598,689
DNA001-84-C-0351	6/15/84 - 12/15/84	149,933
DNA001-85-C-0101	3/12/85 - 6/12/87	1,148,230
DNA001-87-C-0004	3/ 5/87 - 10/23/91	1,490,826
DNA001-89-C-0096	4/24/89 - 7/31/92	2,329,516
DNA001-92-C-0117	7/ 1/92 - 6/30/95	<u>2,481,266</u>
<b>Total</b>		<b>13,598,939</b>

2 )

4-23-96

Mrs. Broudy, in response to your April 18, 1996, memo which was faxed to Brad Underwood, let me try to explain why we are unable to provide a response at this time. Specifically, you have requested the number of veterans receiving compensation under Public Law 98-542 (VA Regulation 38 CFR 3.311); a break down by veteran and surviving spouse; and, the percent assigned to the veteran's condition.

As I responded earlier, we do not maintain these data. Let me clarify this statement. Our data bases do not maintain statistics on actual grants of service connection under 38 CFR 3.311 and we have no way to retrieve this information from our automated data bases. This information would be obtainable only through a manual review of over 18, 000 claims folders. Since historically the grant rate under this regulation has been quite small, we believe that it currently would be fewer than 50, but that number is only an unverified estimate.

As to the break down by veteran and surviving spouse on presumptive grants of service connection (38 CFR 3.309(d)), we do not maintain this information on a routine basis and cannot provide it immediately. To obtain this information, we must make a special request to our data information and systems staff. That type of project requires at least a week to perform since the procedure for extracting the data is complex and time-consuming. Given your time constraints of a matter of hours, I responded that the information could not be supplied. I have asked that this project be initiated. However, let me point out that the data base from which the information must be extracted may impose limitations, but I will explain them to you once the information is obtained. Again, let me point out that this type of project requires at least a week to complete so I am not sure it will be available to you before you testify at the April 30, 1996, Congressional hearing. We will try to accommodate your schedule.

Kathy Collier, Staff Consultant  
Office of the Director, Compensation & Pension Service

RADIATION RISK ACTIVITIES REPORT  
VETERANS' ADVISORY COMMITTEE ON  
ENVIRONMENTAL HAZARDS

August 1993

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### Radiation-related Military Occupations

The eleven ten types of military occupations discussed below are those in which personnel who were involved prior to 1970 might have received exposure to ionizing radiation. (A list of 10 activities provided by the Defense Nuclear Agency is found at Appendix III.) All of the information used by the Committee in reviewing these occupations and assessing their potential for such exposure was provided to the Committee by the Defense Nuclear Agency and the Departments of the Army, Navy and Air Force. In addition to the printed material, presentations to the Committee were made by personnel from the Defense Nuclear Agency and the Navy. The Committee then evaluated the information on each occupation to determine the adequacy of the records and the feasibility and appropriateness of additional investigation to determine whether the veterans in that group were likely to exhibit an increased frequency of adverse health effects due to the radiation.

It should be stressed that the Committee's judgement that a particular group was unlikely to show such an increase should not be interpreted as suggesting that some individuals in that group might not have received appreciable doses of radiation.

#### 1. Naval nuclear propulsion workers.

This group, which includes nuclear shipyard workers (nearly all of whom are civilians) as well as military personnel manning US Navy nuclear propulsion vessels, is fairly large (more than 250,000) and

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has excellent dosimetry records. The average occupational exposure of each person monitored in the program has been about one-quarter rem per year, and the total lifetime exposure from radiation associated with nuclear propulsion plants for all personnel monitored since 1954 has averaged about one rem per person. Individual doses exceeding 5 rem per year were received by a few individuals prior to 1967; since then, no person has exceeded the Federal limit of 3 rem per quarter year, or 5 rem per year for nuclear propulsion personnel. A study of one component of this group, 76,160 US Navy submariners, has reported no increase in mortality associated with this occupation. (Charpentier, et al., 1993)

## 2. Medical radiation workers.

Although this group may prove to be quite large (up to 100,000), the dosimetry records are not as complete as for the nuclear propulsion workers (above), and some personnel might not have been badged at all. The military services are being asked to attempt to identify the various activities that may fall within this category and distinguish them in the dosimetry database. The maximum total dose per year would probably not exceed 1 to 2 rem per year, which is the same as civilian medical radiation workers in occupations with similar titles. Furthermore, the epidemiology would be complicated by the likelihood that many persons in the group would have continued to do work of this type after their separation from

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military service. This group could provide useful information only if the data could be arranged to capture those individuals with many years of military service, and doses could be assigned to that portion of the group.

### 3. Industrial radiation workers.

This group includes non-destructive test workers for both aircraft and ships, as well as an assortment of others involved with depleted uranium, moisture detectors, calibration sources, self-luminous gunsights, etc. The group is probably not large (5,000 to 10,000), but many of the personnel had the potential for exposure to neutrons as well as X and gamma rays. It is likely that many, if not all, of those personnel are included in the services dosimetry data base but it is currently not possible to identify them as members of this group.

### 4. DoD support of nuclear weapons development.

This group consisted almost exclusively of 18-24 year old males who performed guard duties at nuclear installations, and none of them seems to have been badged. The Defense Nuclear Agency has estimated that there may have been as many as 10,000 service personnel in this group. Other information provided to the

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Committee suggests that this group may be even larger. Also included are a handful of active-duty military personnel who were assigned as scientists, technicians and support staff to weapons development facilities. The latter would have been in the Atomic Energy Commission dosimetry program, but acquiring dose information for the group as a whole would be very difficult. Furthermore, it is highly unlikely that the personnel on guard duty would have received more radiation than that of badged civilian workers.

#### 5. Naval radioactive waste workers.

This is a very small group, probably including fewer than one thousand military personnel who were involved in packing, loading and transporting radioactive wastes for disposal at sea. It would be difficult to obtain useful information on the individuals because they were typically on temporary assignment to engage in the disposal, and returned to their regular duties afterwards. Furthermore, many were not badged while engaged in the activities. It is likely that the doses received were low, but the Committee is seeking further information on whether some individuals might have received significant exposures.

#### 6. Nuclear weapons maintenance workers and handlers.

This group of military personnel, some 75,000 to 100,000 individuals) inspected and tested nuclear weapons and replaced those

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components that have a limited lifespan. It is of great potential interest because of its size and because the personnel had a greater potential for neutron exposure as well as doses of 10-20 rem, with neutrons comprising as much as two-thirds of the total. The exposure records kept prior to 1970 were not as sophisticated as today's, and building a database would be expensive, but Intrinsic Radiation (INRAD) surveys exist for all weapons that ever were in the system, and it is possible to track every person who went to maintenance school and his or her subsequent history, so the effort could yield worthwhile results. A group of retired maintenance workers has agreed to cooperate on studies of how the work was actually performed, as opposed to the instructions found in the manual, which would make dose reconstruction even more feasible. Although the data currently available for this group are scant, the Committee has urged DoD to continue its work on the reconstruction and keep it advised of its progress.

#### 7. Nuclear accident responders.

This is a small group (possibly 1,000 individuals) of military personnel, mostly Air Force, who participated in cleanup activities after any of the 12 accidents involving nuclear weapons. The primary hazard was from plutonium inhalation, and bioassay data are generally available for the group. The dose data are not computerized and thus difficult to access, but it appears that the doses involved were small, ranging up to perhaps 100 millirems.

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#### 8. Underground nuclear test program participants.

This group consists of about 60,000 military personnel, all of whom were badged during their activities related to underground nuclear tests. Good dose data are available by test and by year, but the vast majority of participants received doses of zero. Some -- a very few -- may have received up to one or two rem, primarily while taking part in reentry mining activities at the test site. It might be useful to pay further attention to the portion of the group that received the higher exposures.

#### 9. Nuclear cleanup workers from Eniwetok and Johnson atolls.

This is a small group (6,000 to 7,000) of military personnel who were involved in a three-year cleanup of two sites contaminated by atmospheric testing many years previously. Film badge and bioassay data are available, but the detection level for the film badges at that time was 1 rem, and those with lower or zero doses were recorded as having had a 1 rem exposure. Because of the small size of this group and the uncertainty of the dose data, it is unlikely that it will provide useful information.

#### 10. Air crews.

The largest component of this group, including ground-support and flight deck personnel (5,000 to 14,000) is unlikely to have had

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opportunity for significant exposure. A second component, flight crews (totalling perhaps 700-1,300 persons), might have received significant exposures. However, they were not the result of routine flight activities, where their exposures would be much the same as civilian airline crews, but from flights associated with atmospheric weapons testing, including penetration of the fallout clouds. The third component, astronauts and U-2/SR-71 pilots, is very small (about 400). All of the personnel in the latter two components were badged, and dose data are available, but the Committee believes that the numbers are so small that their further study is not likely to be fruitful.

#### 11. Other Activities

The Committee is aware that the above list is not necessarily complete. Other relevant military occupations may come to light, or other groups of individuals may be found that should be included in the activities already identified. For example, the Committee has received information that some number of American service personnel participated in or observed atmospheric nuclear tests conducted by other countries. The Committee does not know how many individuals that may include nor the levels of their exposures. Also, additional exposures may have occurred due to the release of radioactive materials at the Hanford Reservation; information concerning this may become available through the dose reconstruction project. The Committee would welcome additional information on exposures of military personnel that have not been addressed so far.

**Consideration of Internal Dose  
Received by Atomic Veterans  
During Continent Nuclear Tests**

by William J. Brady  
Principal Health Physicist  
Retired from Nevada Test Site  
Prime Support Contractor  
April 22, 1996

Concern exists among atomic veterans that they have not been assigned the total radiation doses they received during participation in atmospheric nuclear detonation tests. Having 36 years of experience in radiological safety at the Nevada Test Site (NTS) and having been a member of two National Academy of Sciences/National Research Council committees, one the Committee on Ionizing Radiation Dosimetry and the other the committee on Film Badge Dosimetry in Atmospheric Tests, I feel qualified to comment on the subject of dose received by atomic veterans from internally deposited radionuclides. My qualifications also include collecting and preserving personnel radiation exposure records starting in 1957 and computerizing in 1966-1969 the master file of personnel radiation exposure records for U.S. nuclear testing from 1945 forward in the Pacific and on the continent, and testimony as an expert witness on radiation dose regarding radiation injury lawsuits against the government and its contractors.

In addition, for 12 years I was the representative of my company at Defense Nuclear Agency (DNA) meetings of the Nuclear Test Personnel Review (NTPR), a program to identify military participants in nuclear testing and their radiation exposures. These meetings were mostly on a monthly basis and I presented briefings at each one. DNA and the General Accounting Office during two investigations considered me the DNA NTPR personnel dosimetry expert. The Department of Energy (DOE) also should be mentioned because our company was under contract to DOE and its predecessors and I usually also represented the DOE Nevada Operations Office at NTPR meetings. The DOE Office of Military Applications, the office responsible for nuclear testing, gave me the Award of Excellence in 1988 for significant contribution to the nuclear weapons program in the area of radiological safety at NTS.

The subject of internal radiation dose received by atomic veterans also has been of concern to me for many years. It is my opinion that many atomic veterans received internal doses much greater than their external gamma plus neutron doses. The DNA NTPR dose reconstruction contractors, however, have avoided assigning internal doses to most atomic veterans of continental tests. In particular, Science Applications International

Corporation (SAIC) appears to have intentionally avoided assigning these internal doses by developing an "internal dose screen" to eliminate units of military participants from eligibility for individual internal dose reconstructions. This screen requires an estimated 150 mrem to the bone before a dose reconstruction can be performed, and most military units in continental testing fail the test, according to the SAIC "internal dose screen" report published in 1985. The fact that bone is immune to sarcoma, or cancer, caused by radiation was known and in the literature as early as 1972 and widely published by 1980 apparently was ignored by SAIC in establishing their "screen."

Our government knew in 1951 that radioactive particles breathed into the lung or swallowed were more hazardous than external radiation exposure. A reference dated 21 and 22 May 1951 from Los Alamos, New Mexico, discussed possible dose to the lung from inhaled fission product particles. It was classified Secret, Restricted Data, until it was declassified for public release 16 February 1995. The document is titled "Notes on the Meeting of a Committee to Consider the Feasibility and Conditions for a Preliminary Radiological Safety Shot for Operation Windsquall." This refers to what later became the surface and underground tests of Operation BUSTER-JANGLE in the fall of 1951. One quote about exposure downwind is as follows:

So I think from the point of view of external radiation, we don't need to worry very much. But the particle size problem is a great worry, because we don't know much about the effect of small, hot particles in the lung. On the basis of the possibilities of the kind of dose one might get from breathing particles which might become fixed in the lung, the boys at AFSWP [Armed Forces Special Weapons Project] and I have made calculations, particularly for 1 micron particles, the ones most likely to remain fixed in the lung, and the dose comes out around 800 rep [664 rad] to a small sphere of tissue in the immediate vicinity of the particle

The speaker was Dr. W. Klaus of the Atomic Energy Commission/Headquarters, Division of Biology and medicine. He went on to say "However, one can always say that there have been so many of these particles spewed about the country (from past tests) that so many people have already breathed pretty hot particles (why be concerned with it now). (We cannot, however, seriously consider that an argument.)"

Another summary quote in Appendix II of this document is as follows:

A few 5-micron particles may be retained for a relatively short time, but the retention is of significance only between about 0.5 and 2.0 microns diameter.

A particle of this size might carry a beta-ray activity of one-hundredth microcurie, and become fixed in one spot in the lung, say four hours after the shot, would deliver [sic] an average dose of about 385 rep [320 rad] to a millimeter sphere of tissue surrounding it. On the basis of the above discussion, however, it is not considered that such an idealized dose from a few such particles would be hazardous. On the other hand, a large number of such foci in the lung, such as breathing a high concentration of such particles, might conceivably interfere with normal metabolic processes and hence lead to lung cancer. It therefor appears desirable to limit the number of particles which might be breathed and retained.

Many atomic veterans were exposed much earlier than four hours after a shot when fission product activities were greater. Furthermore, their lungs were exposed to much more than just new fission product particles. Fission products from 1951 and later tests remained close to the Nevada Test Site soil surface to be resuspended by shock waves. At 1957 Shot Hood, many old fallout patterns crisscrossed the troop maneuver area. Shot Wilson, fired 16 days before Hood at the same balloon ground zero, deposited fresh fission product activity directly on the Hood maneuver area. Worse yet, Shot Lassen, again at the same ground zero as Hood, was fired 29 days before Hood and was a dud, spreading plutonium 239 over the maneuver area.

Marines left their trenches 15 minutes after Hood and marched toward ground zero to within 370 meters, rested for 5 or 10 minutes, and marched back out. They covered more than 6 1/2 miles in less than two hours. There is no way they could have worn assault masks marching at more than 3 miles per hour on 5 July in the heat of the Nevada desert. Besides not being able to breathe properly, vapor from their perspiration would have condensed on their eyepieces so they could not see. Sagebrush and Joshua trees were on fire around them as they marched, creating more heat and smoke to obscure their vision, along with dense resuspended radioactive dust. Obviously, these Marines were breathing all the radioactive particles described plus soil particles activated by neutrons from the Hood detonation.

According to the 1962 edition of The Effects of Nuclear Weapons edited by Samuel Glasstone, prepared by DoD, and published by the AEC, highly radioactive manganese 56, a predominant NTS soil activation product, is a serious hazard, as the following quote indicates:

Because its half-life is less than sodium-24, manganese-56 loses its activity more rapidly. But, within the first few hours after an explosion, the manganese may constitute a serious hazard, greater than sodium.

With a half life of 2.6 hours, manganese 56 does not have time to leave the alveolar sacs and lymph nodes, and would not anyway because it is in oxide form, but it does seriously irradiate them. Glasstone has this to say about radioactive particle sizes:

Furthermore, the optimum size for passage from the alveolar (air) space of the lungs to the bloodstream is as small as 1 to 2 microns... Any very small particles reaching the alveolar spaces may be retained there or they may be removed by physical means, e.g., by coughing, or by the lymphatic system to lymph nodes in the mediastinal (middle chest) area, where they may accumulate.

Glasstone is referring to fallout from nuclear debris clouds and states that the number of these particles in that case is small. Atomic veterans, however, did not have to wait for these particles to fall from a cloud. They were resuspended in the dusty air the troops were breathing as they approached ground zero or visited equipment display areas, as close as 270 meters for Hood and 500 meters for the 1957 Shot Priscilla. DNA published in its history of Priscilla a picture of Marine and Army troops looking at a mangled vehicle of some kind, obviously close to ground zero. The troops looked at the display from 2 hours until 4 hours after the shot, and none of them were wearing respiratory protection. Dust was elevated to 100 meters by the blast wave, and 1 micron particles have a fall rate less than 1 foot per hour. The dust cloud spread out more than four thousand meters from ground zero. Helicopters could not perform their radiation surveys until the day after Priscilla because ground location markers could not be seen. In addition to activation products and fallout from the dust cloud, old fission products from previous shots at the same ground zero were resuspended.

SAIC indicated in their published "internal dose screen" that maneuver troops in both Priscilla and Hood were only exposed to resuspended activation products. This was not true. In addition, the "screen" indicated that such exposures would not result in dose to the bone of 150 mrem and individual dose reconstructions would not be performed. As mentioned above radioactive particles formed after nuclear detonations, except for gases, generally are in oxide form, are not readily soluble, and are retained in the alveolar sacs and the mediastinal lymph nodes. Thus, it appears that SAIC deliberately chose the bone, which they knew was insensitive to radiation exposure, as a "screen" organ because they knew using bone would eliminate internal dose reconstructions for most military maneuver participants in continental atmospheric nuclear tests.

Another quote from the first document referenced supports this contention. Dr. G. Failla commented regarding the committee's attempts to establish a permissible air concentration of fission

product particles as follows about strontium 90, a fission product that is assimilated by the bone, if it can get there:

Perhaps, as Dr. Warren suggested, we take the accepted concentration of  $Sr^{90}$  [strontium 90], and figure particles /m<sup>3</sup> [per cubic meter] of air... This permissible concentration [strontium 90] in air is based on the material being soluble so it can go to the bone. So this may not help us.

In other words, oxidized fission products from a nuclear detonation do not go to the bone. Neither do oxidized activation products and plutonium 239 oxide. Thus, SAIC certainly must have known what would result from using bone for the "screen," in addition to other "screen" criteria that caused most maneuver participants to be ineligible for internal dose reconstruction.

Two conclusions can be drawn. First, many atomic veterans who participated in maneuvers and entered display areas after atmospheric tests at NTS received large internal doses to the alveolar sacs and the lymph system. These doses were much larger than their external doses. In my opinion, many of these internal doses, such as from Priscilla and Hood, were in the hundreds or thousands of rads, certainly high enough to cause concern regarding incidence of radiogenic as well as nonradiogenic diseases.

Secondly, the "screen" has prevented atomic veterans from being assigned their total external plus internal doses and also has prevented them and their survivors from receiving compensation as provided by Public Law 98-542.

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## United States Senate

COMMITTEE ON VETERANS' AFFAIRS  
 WASHINGTON, DC 20510-6378

October 25, 1994

The Honorable Jesse Brown  
 Secretary of Veterans Affairs  
 810 Vermont Avenue, N.W.  
 Washington, D.C. 20420

Dear Jesse,

I am writing to raise two issues relating to service connection for conditions based on exposure to radiation.

First, I remain concerned about a reference made in VA correspondence to a flawed 1985 National Academy of Sciences study of five nuclear detonations entitled "Mortality of Nuclear Weapons Test Participants." The reference was in a VA white paper on presumptive service connection based on radiation exposure that was enclosed in a February 24, 1994, letter to Patricia Broudy of the National Association of Atomic Veterans. In a July 18, 1994, letter to me, you indicated that the reference to that NAS study was to provide "historical perspective" only.

I continue to believe that the reference to the NAS study was extremely misleading.

The study is cited in the white paper as the "largest health-consequences study of test participants" which "indicated no overall increased death rates due to cancer among the 50,000 individuals studied." The white paper indicates that this study played a significant role in VA's adoption of section 3.311b of title 38, Code of Federal Regulations, which is still in effect.

My concern is that the white paper neither notes that this study was later found to be flawed, nor does it discuss subsequent scientific developments concerning the health effects of exposure to ionizing radiation. As a result, the white paper does not make clear the evolution of the scientific understanding of the health effects of radiation exposure. While that study may have served as the basis for VA's policy at the time it was completed, it should no longer be cited as support for current policy, which is, in effect, the implication of the reference in the white paper. If section 3.311b is premised on that study, it can no longer be justified.

The Honorable Jesse Brown  
October 25, 1994  
Page 2

The second issue relates to the establishment of presumptions of service connection for diseases based on exposure to ionizing radiation. It is clear that the law allows you, as Secretary, to establish presumptions generally when you find that there is sufficient evidence supporting such a decision.

With respect to claims based on radiation exposure, however, it is not clear to me that you believe you have such authority. For example, while I know that a number of requests have been made to you -- from groups advocating on behalf of atomic veterans, as well as from Members of Congress -- to add certain conditions to the list of those afforded presumptive service connection (specifically, all the conditions that now may be compensated under Public Law 98-542 and section 3.311b), you have not taken any action on this issue.

Also, I note your May 31, 1994, letter, relating to your decision concerning bronchio-alveolar carcinoma under Public Law 102-578, in which you declined to exercise your authority to establish a presumption of service connection for that condition in radiation-exposed veterans.

In contrast, you recently decided to add to the list of "radiation-risk activities" any such activities that occurred in other countries but involved our Nation's veterans. Clearly, you believed that current law afforded you sufficient authority to take this action.

I am interested in knowing why you have not used your authority with respect to adding diseases related to radiation exposure when squarely presented with the opportunity to do so, and would appreciate it if you would distinguish for me your action to add activities that occurred in other countries from action that would involve adding conditions to the list of presumptions based on radiation exposure.

Jesse, I look forward to hearing your thoughts on these issues. My best regards to you.

Sincerely,



John D. Rockefeller IV  
Chairman



THE SECRETARY OF VETERANS AFFAIRS  
WASHINGTON

FEB 24 1994

Ms. Patricia Broudy, Legislative Director  
National Association of Radiation Survivors  
33492 Periwinkle Drive  
Monarch Beach, CA 92629

Dear Ms. Broudy:

This is in reply to your November 26 letter asking that the Department of Veterans Affairs (VA) add to the list of diseases statutorily presumed to be service connected if suffered by atomic veterans. The Deputy Under Secretary for Benefits has prepared the enclosed Fact Sheet addressing the issues raised in your inquiry. Your interest in these matters is always appreciated, and I thank you for sharing your thoughts with us.

Sincerely yours,

A handwritten signature in cursive script that reads "Jesse Brown".

Jesse Brown

Enclosure

JB/set



FACT SHEET ADDRESSING THE INQUIRY OF  
MS. PATRICIA BROUDY

ISSUE: Presumptive Radiogenic Diseases.

DISCUSSION: In 1984, Congress enacted legislation requiring VA to adopt regulations identifying the diseases it would recognize as radiogenic and setting forth procedures for adjudicating claims from atomic veterans. In 1985, after consultation with the Veterans Advisory Committee on Environmental Hazards (VACEH), VA declined to adopt presumptions of service connection for atomic veterans on the grounds that they would be unjustifiably overinclusive. Although VA realized that there will always be some uncertainty about the precise levels of exposure for certain individuals, the overwhelming weight of the evidence was that the vast majority of both atomic-test participants and Hiroshima-Nagasaki occupation forces was exposed to radiation at such low levels as to pose no appreciable health risk.

The official film-badge data for atomic-test participants showed that fully 42 percent received no dose whatsoever, and the average for all participants was only 0.5 rem. Less than one percent received doses exceeding 5 rem, which, under Federal guidelines, was the allowable annual exposure for radiation workers. The doses for Hiroshima-Nagasaki occupation forces were even lower, given their geographic locations relative to the detonation hypocenters, their duty assignments, and their introduction into the areas affected by the bombs weeks after the detonations. An official worst-case estimate by the Defense Nuclear Agency was that no dose could have exceeded a single rem.

While available evidence indicated doses at these levels would be unlikely to produce adverse health effects in substantial numbers of exposed individuals, at the same time, another piece of information weighed heavily on VA policy. The largest health-consequences study of test participants, a mortality study by the National Academy of Sciences (NAS), indicated no overall increased death rates due to cancer among the 50,000 individuals studied.

Against this backdrop, VA concluded that it would be contrary to the standard prescribed by Congress in 1984 ("sound scientific and medical evidence") to establish blanket presumptions. Instead, VA determined that meritorious claims should be identified by special procedures designed to ensure that individual cases are reviewed thoroughly and that the reviews are based upon the best evidence available, with reasonable doubt always resolved in favor of the claimant. With these goals in mind, VA published 38 CFR 3.311b to govern compensation claims based on exposure to ionizing radiation.

FACT SHEET - Ms. Patricia Broudy

Page 2

The circumstances surrounding herbicide and mustard gas exposure which prompted us to adopt administrative presumptions of service connection are sufficiently different to warrant different treatment. Considerable uncertainties remain not only about who was exposed but also about the extent of exposure. Furthermore, much less is known about the dose responses of exposures to herbicides or mustard gas, as compared with the relatively well studied field of radiation exposure. For example, there is for herbicides and mustard gas nothing like the radioepidemiological tables of the Department of Health and Human Services, from which one may estimate the likelihood that certain health problems are the result of specific radiation exposures.

VA's position can be illustrated by an example taken from your > recommendation that skin cancer be presumed service connected for all atomic veterans. In recognizing skin cancer as potentially caused by radiation, VA made clear that such an association has not been demonstrated at low doses. Certain skin cancers are ordinarily caused by exposure to ultra-violet light. Rather than adopt a vastly overinclusive presumption for all atomic veterans, VA's policy is to review each claim on its own merits, in order to identify those in which exposures may have been unusually high or in which the cancer site corresponds to the anatomical site of exposure (e.g., in the cases of veterans exposed while undergoing radiation therapy).

We realize that this policy must be reviewed continually to ensure that it reflects new scientific advances. With the assistance of the VACEH, we are monitoring such new developments as the reevaluation of data from the NAS mortality study to see if new directions are indicated. We will also continue to update our list of radiogenic diseases so that all deserving claims can be approved. However, at present, we are not convinced that it would be sound policy for VA to automatically presume that additional diseases are service connected.

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 NATIONAL ASSOCIATION OF ATOMIC VETERANS
 

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February 1996

Pat Broudy  
 Legislative Director  
 33492 Periwinkle Drive  
 Monarch Beach, CA 92629  
 Ph. (714) 661-0172  
 Fax (714) 661-3108

**PROPOSED LEGISLATIVE AGENDA FOR THE NATIONAL ASSOCIATION  
 OF ATOMIC VETERANS**

The members of the National Association of Atomic Veterans (NAAV) propose changes in the laws affecting atomic veterans and their survivors as follows:

**PL 98-542, PL 100-321, PL 102-578 and PL 101-426 as amended by PL 101-510**

1. We recommend that veterans eligible under these laws must include those participants in the following 11 additional radiation risk activities as well as participants in nuclear tests, U.S. occupation forces in Hiroshima and Nagasaki, Japan, between August 1945 and July 1946, and those similarly exposed to ionizing radiation while a prisoner of war in Japan.

- + Naval nuclear propulsion workers;
- + Military medical radiation workers;
- + Industrial radiation workers;
- + DoD support of nuclear weapons development;
- + Naval radiation waste workers;
- + Nuclear weapons maintenance workers and handlers;
- + Nuclear accident responders; code name "Broken Arrow;"
- + Underground nuclear test program participants;
- + Nuclear cleanup workers from Eniwetok and Johnston Atolls;
- + Air crews; cloud penetrators;
- + Other activities.

Because some of the 11 other classes of atomic veterans continued to receive ionizing radiation exposures after 1962 and in the case of underground testing, until 1993, we recommend the laws be changed to eliminate all time constraints regarding veterans exposed to ionizing radiation as a result of nuclear testing and any exposure to ionizing radiation during the nuclear testing era or as a result thereof.

2. We recommend that all laws affecting radiation victims be uniform, and that compensation, types of radiation-related illnesses and locations of radiation exposure be as one. Radiation is radiation, and it shouldn't make any difference where the exposure takes place, if it was within the time frame suggested above, and if it was in any way connected to ionizing radiation exposure. As an example of the inequities extant in various laws pertaining to radiation victims, we point out the differences between the laws affecting the Marshall Islanders and atomic veterans. Although veterans were

exposed to the same tests for which Marshall Islanders receive compensation for many illnesses, our atomic veterans are denied those benefits. Lung cancer and all lung diseases for which compensation is awarded uranium miners, is not awarded other radiation victims. We cite the difference in compensation for all who fall under P.L. 101-426 as amended by P.L. 101-510 (RECA), i.e., \$100,000 for uranium miners; \$50,000 for downwinders and \$75,000 for testsite workers (which includes veterans exposed at the testsites). In the case of testsite participants only, the \$75,000 is offset by Social Security benefits obtained for the same illness as well as survivors' benefits for the children and spouses.

Lung cancer and colon cancer as an example, are considered radiogenic in P.L. 98-542, but not presumptive in P.L. 100-321. Others listed in both P.L. 98-542 and P.L. 100-321 as amended, (for instance, leukemia) although the same, are not considered presumptive if listed in P.L. 98-542 but are considered radiogenic *and* presumptive in P.L. 100-321 amended by P.L. 102-578. It is necessary in P.L. 98-542 to prove causation and dose, while the same cancer if listed in the presumptive laws does not have those requirements. The 13 presumptive cancers listed in P.L. 100-321 were listed in RECA. When P.L. 100-321 was amended by P.L. 102-578, adding two more cancers, the same was not done for RECA.

3. To end this confusion and make all radiation victims and their survivors equal in all respects, it is our suggestion in the case of atomic veterans that all illnesses contained in P.L. 98-542 and not in the presumptive laws (P.L. 100-321 and P.L. 102-578) be incorporated in the presumptive laws, after which, P.L. 98-542 should be repealed in its entirety.

4. We further suggest the Veterans Committees recommend to the Secretary of Veterans Affairs (VA) that all claims denied by the VA on the basis of the *Report of the National Institutes of Health ad hoc Working Group to Develop Radioepidemiological Tables and the Mortality Study of Nuclear Weapons Test Participants* be reexamined on the basis that the two studies, both published in 1985, were inconclusive and flawed, respectively.

5. We require that a registry be established for the offspring of the atomic veterans, and that these offspring be awarded financial benefits for their care and treatment if they are afflicted with any genetic/mutagenic physical, neurological or mental problems which can be attributed to a parent/grandparent because of his/her participation in any of the radiation-exposed situations outlined above.

Patricia Broudy  
Legislative Director, NAAV

**WRITTEN STATEMENT OF THE NATIONAL ASSOCIATION  
OF RADIATION SURVIVORS**

**Before the**

**HOUSE VETERANS AFFAIRS COMMITTEE:**

**SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE, AND  
MEMORIAL AFFAIRS**

**APRIL 30, 1996**

**Prepared by  
Fred Allingham, Executive Director**

**Oral Testimony by  
Tom Smith, Legislative Director**

The National Association of Radiation Survivors (NARS) welcomes this opportunity to comment directly to the House Veterans Affairs Subcommittee on Compensation, Pension, Insurance, and Memorial Affairs on both the proposed legislation by Representative Lane Evans and on the report of the Advisory Committee on Human Radiation Experiments.

## **I. IN REFERENCE TO REPRESENTATIVE EVAN'S PROPOSED LEGISLATION.**

### **A. Membership of Veterans Advisory Committee on Environmental Hazards**

NARS believes that there are military veterans who, because of in-service or post-service training, qualify to sit on this committee to represent the interests of Atomic, Agent Orange and Gulf War veterans. Currently the committee members are seen by many veterans as interested individuals with a stake in denying many of the environmental hazards faced by servicemen while in the military. Inclusion of representatives of the veteran groups might lend some credibility to their findings.

### **B. Review of Defense Nuclear Agency Procedures for Determining Radiation Dosages**

NARS is opposed to a review of DNA dosage procedures by the National Academy of Sciences for the same reasons as outlined above for the Environmental Hazards Committee. It appears to us that the Academy has the same interest in denying the adverse effects of exposures to radiation as the scientists and medical personnel on the environmental committee. While the government Accounting Office has found the DNA procedures lacking in the past, the Academy has found no problems. There is a core interest in finding that ionizing radiation is harmless so that both commercial and military research, development and experimentation may continue...activities in which the scientific and medical communities clearly benefit.

To make such a review credible it would be appropriate to appoint a committee with representation by the atomic veteran community charged with identifying independent scientists to review and report on the DNA procedures. As above, there are atomic veterans with the credentials to sit on such a committee and there are scientists who either have proven themselves impartial or who do not have a career stake in nuclear-related research or development.

### **C. Changes to DVA Law**

#### 1. Compensable Diseases

We are, of course, supportive of the additions of the listed diseases in the Evans bill to the presumptive list of compensable diseases. In our database of over 11,000 survivors, we have atomic veterans who will directly benefit from these changes in the presumptive list.

Obviously we would prefer other kinds of illnesses added to the presumptive list. Skin cancer and lung cancer in particular are common cancers among these survivors. It seems the Department of Veteran Affairs blames the former on sun exposure and the latter on smoking. In addition, there are numerous non-cancers that are common among atomic veterans that we believe are radiogenic in nature. This appears to be confirmed by the fact that other survivor groups in our database, Test Site Downwinders, Hanford Downwinders, Uranium Miners, etc., also experience these common health problems.

While we accept that smoking cigarettes is bad for one's health, it does not necessarily follow that smoking alone is the cause for lung cancer. The BEIR V report, page 53, indicates that there was "...evidence of a synergistic (greater than additive) effect" between smoking and radiation exposure that increases the incidence of lung cancer among smokers versus non-smokers. When one takes into consideration the military's role in smoking among the age groups we are talking about, through their

NARS Veteran Affairs written testimony, page 2

provision of free cigarettes in 'K' and 'C' rations and tax free tobacco purchases through military stores, it does not appear just to penalize smokers by excluding their lung cancer from presumptive compensation. Without access to free or inexpensive tobacco, many of these men may have never smoked but still, according to BEIR V, have had a chance of lung cancer based on their exposure alone. Yet the DVA insists on attributing lung cancer to smoking when the BEIR V evidence indicates that 'just as likely as not' it is the combination of exposure and smoking that caused the problem.

Then there are those who never smoked who became inflicted with a particular form of lung cancer identified in the BEIR V report, page 277, as a plutonium inhalation-induced cancer called bronchioloalveolar. Since there was no human data available on lung cancer due to internally deposited radionuclides, the studies done have been on animals and particularly beagle dog studies. Yet there are numerous atomic veterans who have this kind of lung cancer. If the evidence is that these men did not smoke, then 'just as likely as not' their cancer is radiation induced.

Skin cancer is another example of unjust application of the law. The DVA attempts to portray most skin cancers as induced by continued exposure to the sun. While we know today that knowledgeable people will protect themselves from excessive exposure to sunlight, the age group we are primarily discussing did not have the benefit of the scientific information we have today. Yet again, there is a combining effect between irradiation and exposure to the sun as reported in BEIR V, page 32, "...the carcinogenic effects of x-irradiation were enhanced by exposure to ultraviolet radiation..." It is 'just as likely as not' that without the radiation exposure, these men would not have developed skin cancer.

There are the class of diseases that we would normally expect to find in older persons but that, in the case of atomic veterans, began appearing in their middle ages. These include cardiovascular and neurological disease, bone and muscle deterioration, arthritis, sterility, and hypo- and hyper- thyroid diseases. There are also a full range of autoimmune deficiency problems such as diabetes, systemic lupus, pernicious anemia and connective tissue disorders

Finally we have the problems of genetic disorders in children and grandchildren of the exposed. Depending on the exposure experience, from 15-20% of atomic veterans identify themselves as having children with some form of genetic defect. This class of veteran includes those whose wives experienced multiple miscarriages, stillbirths and children with actual health problems after birth. It is a tragedy that the National Academy of Sciences recently determined that they could not perform a study of genetic effects on the progeny of atomic veterans. Money and the ability to obtain a proper cohort were cited as the primary factors in reaching this conclusion.

It continues to amaze us that the Executive and Legislative branches of government always seem to find the money when an issue of *their* concern arises, but somehow the lack of money is always cited when talking about the victims of the government's negligence. The last we heard, the Defense Nuclear Agency had been in contact with at least 60,000 of the 250,000 veterans classified as atomic veterans. Most, if not all, of these veterans or their survivors have filled out a DNA questionnaire. A study of just those 60,000 would certainly have given you some indications as to the legitimacy of the genetic issue.

## 2. DVA Claims Processes

Contrary to the information put out by the DVA, which is at best disingenuous, only 3-4% of atomic veterans have had claims granted by the DVA, and the majority of those have been awarded to the survivor of a veteran. Of those claims granted to the atomic veteran himself, close to 25% have involved ratings of zero percent, meaning no compensation benefit at all.

NARS Veteran Affairs written testimony, page 3

We base this on the first and only time we received a clear break-out of total claims to claims granted by risk activity and beneficiary. This was at our 1991 conference in Seattle Washington. In summary what they gave us in their "RADIATION STATISTICS" was:

12,000 claims filed under both CFR 3.311b (PL 98-542) and CFR 3.309(d) (PL 100-321).

62 veterans of atmospheric exposure and 29 of occupation forces were granted.

25 of the above were rated at zero percent.

108 claims granted to survivors of atmospheric exposed.

59 claims granted to survivors of occupation forces.

5,912 atmospheric nuclear testing claims filed.

2,944 occupation forces claims filed.

1,973 occupational or therapeutic claims filed.

1,490 claims classified as other.

Service connection granted to a total of 1,100 not all of which were granted due to radiation exposure.

From the above one can figure the data and it shows that as of 9/30/91:

Of the atmospheric claims, 1.04% had been granted to the atomic veteran and 1.8% granted to a survivor.

Of the occupation claims, 2.1% had been granted to the atomic veteran and 2% granted to a survivor.

If the total claims granted equal 1,100 and those granted for atmospheric and occupational forces equal 258, then we must conclude that the other 842 granted claims were for the occupational/therapeutic or other category which would equal a 24.3% success rate for this group.

What this tells us is, assuming that subsequent claims reasonably follow the same pattern, that today when the DVA says that over 15,000 claims have been filed and 1,500 granted that most likely over 1,100 of those granted go to a category other than the atomic veteran leaving the atomic veteran success rate in the 3-4% range.

### 3. Conclusion: The laws are not working for atomic veterans. Why?

1. Only a limited number of cancers are included and, more importantly, only a few non-cancers that are very common among atomic veterans.

2. Few if any atomic veterans or their survivors can afford to hire a certified expert to perform the independent dose reconstruction required under PL98-542. Of the handful that has done so, most have had problems obtaining the raw data used by the Defense Nuclear Agency to compute their dose estimate or the independent expert or the reconstruction has been challenged. Of the one known success, it took the Court of Veterans Appeals to force the DVA to perform its function under the law once the dose reconstruction had been submitted. The claim was eventually granted, not for the dose reconstruction per se, but because of benefit of the doubt provisions of the veteran laws.

3. Despite the language of PL 100-321 that only requires a *primary* cancer for the liver, the DVA interprets the law to include each listed cancer as a primary one. Thus in cases where there are two or more organs involved and medical personnel cannot determine the original site of a cancer, the claim is denied.

4. In claims relating to certain organs, such as the lung and skin, the DVA finds other factors such as smoking or sun to account for the disease and deny the claim.

NARS Veteran Affairs written testimony, page 4

5. National veterans service organization officers don't know enough about radiation-exposed veterans law to adequately prosecute claims and the veterans or their survivors often do not know how to file appropriate claims.

NARS Veteran Affairs written testimony, page 5

6. There is a remand system that keeps bouncing claims up through the Board of Veterans Appeals to the Court of Veterans Appeals and back, consuming years in the process.

7. Veterans or survivors become discouraged and disillusioned and give up their claims in despair.

So, NARS supports the diseases being added but urges that serious consideration be given to further changes in the eligible diseases and the very processes of the DVA itself in order to once and for all end the existing controversy and ensure real justice for those who have served their country with honor and distinction.

## **II. IN REFERENCE THE INVESTIGATION, FINDINGS AND RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON HUMAN RADIATION EXPERIMENTS**

Atomic Veteran organizations in general, and certainly NARS in particular, worked very hard to move the Advisory Committee on Human Radiation Experiments to investigate the situation of atomic veterans in terms of the human experiment issue. We have been appreciative of their efforts to expand the envelope of their charter and in fact look into atomic veterans and experimentation.

Because the charter of the committee did not include atomic veterans it was probably too much to expect comprehensive recommendations in their final report that would go beyond what in fact they did recommend. And their recommendations are a positive first step. However, we believe the evidence uncovered during their investigation justified much stronger findings and more comprehensive recommendations. Our experience with the Inter-Agency Working Group in a recent two day workshop indicates that the evidence uncovered has taken a back seat to the findings and recommendations and thus the heart of the atomic veteran issue has been ignored.

There are some that believe the exposures to radiation while in the service was a normal hazard that servicemen accept when they join the military. We acknowledge that servicemen and women do in fact accept a certain amount of risk when they join the military. This risk however is accepted under the belief that harm might come from an enemy during a period of conflict, not inflicted by their own government as experienced by Atomic veterans, Agent Orange veterans and, most recently, Gulf War veterans.

From declassified documents, including a series of 1943 memoranda to General Groves of the Manhattan Project, it was known that radiation could cause cancer, leukemia and birth defects. The best that can be said about that is that there was a belief at the time that it would take fairly high doses, although this belief was based on fairly slim evidence.

The time period between the first bomb, Trinity and those dropped on Hiroshima and Nagasaki and the first peacetime atomic tests at the Bikini Atoll in 1946 was too short to provide any evidence of the effects of immediate or residual radiation exposure on test participants or occupation forces. We do know however, that servicemen began to die from diseases such as leukemia within three years of their service in the occupation forces as did Frederick Leo Allingham, Jr., the father of NARS' executive director.

Operation Crossroads, involving about 42,000 men in an above water and below water test, so seriously contaminated the ships and Bikini Lagoon, that Stafford Warren, the Medical Director for the test, recommended the cancellation of the planned Shot

NARS Veteran Affairs written testimony, page 5

Charlie and the departure of most of the ships and men from the area. Despite this and the need to sink many of the ships due to their high level of contamination, it is claimed that the men aboard these ships did not receive significant doses of radiation. And despite the knowledge of this contamination, atomic testing using military troops continued.

According to documents uncovered by the Advisory Committee on Human Radiation Experiments and discussed in Chapter I of their report, *The Atomic Century*, (pp 38-39) as late as 1950 the atomic weapons bureaucracy was still asking questions about the biomedical effects of radiation exposure, even though tens of thousands had already been exposed in Japan and the succeeding four test operations.

A debate between the military and the AEC in late 1949 and into the early 1950s focused on the need for human experimentation so that the military would know how atomic warfare would affect the troops. The AEC, in the person of Stafford Warren, argued that human exposures were not necessary and possibly useless because of "extraordinary variables". General Cooney of the Division of Military Applications argued in favor of exposures up to 150 rad in order to reassure the generals about troop exposures.

While it appears in those documents that the civilian side of the AEC won the argument, the desire for troop exposures remained, as evidenced in declassified September 1951 memos (Dept. of Defense, Research & Development Board, Committee on Medical Sciences, Joint Panel on the Medical Aspects of Atomic Warfare, September 18, 19, 20) memos of the Joint Panel on the Medical Aspects of Atomic Warfare. In this memo, biomedical investigation during previous tests and the continuing need for biomedical investigation with humans and animals are acknowledged. At the end of the memos there is a list of 29 types of problems ... "*which should be considered as a legitimate basis for biomedical participation in future weapons tests.*"

Included among these 'problems' are the "types and dimensions of foxholes which are most effective in protecting troops in the field; Effects of exposure of the eye to the atomic flash; Studies of inhalation and ingestion of radioactive materials in fall-out zones; etc.

The memo implies that both humans and animals would be used to answer these kinds of questions. It appears that this was somewhat like the plutonium injection experiments on civilians where humans were compared to laboratory animals for the advancement of science.

Within a month of this last series of documents, testing with troops began at the newly established Nevada Test Site in Operation Buster-Jangle, and as we all know, continued there and in the Pacific, with troops being brought closer and closer to ground zero in each succeeding test.

The Advisory Committee apparently struggled to define all the human experiments in technical, legal/scientific terms so that the vast majority of atomic veterans would not come under the rubric of human experiment. In Chapter 10 of their report, *Atomic Veterans: Human Experimentation in Connection with Atomic Bomb Tests*, page 455, the committee says

That the bomb tests were in some sense experiments is, of course, correct. The tests of new and untried atomic weapons were, wrote the chief health officer of the AEC's Los Alamos lab, "fundamentally large scale laboratory experiments." At the same time, although there was a real possibility that human subject research had been conducted in conjunction with the bomb tests, the tests were not themselves experiments involving human subjects.

NARS Veteran Affairs written testimony, page 6

So the difference to the committee, as they told us at several of their meetings, is that the tests were not conducted solely to experiment on humans, but the measurement of feces, urine, saliva and psychological states became "experiments of opportunity" arising from the testing of bombs and not human experiments in the same sense as the plutonium injections.

We believe, given the documents the committee uncovered and cited above, that this is a spurious distinction designed to relieve the committee of any real responsibility in passing judgment on what the government has done to its atomic veterans. It seems clear that *at least one purpose* of having servicemen at the atomic tests over a 16 year period was to find answers to some of the problems outlined in the memos of the Joint Panel on The Medical Aspects of Atomic Warfare cited above.

If this is true, then servicemen were indeed guinea pigs as they have claimed for years and their military superiors, the Department of Defense, and indeed their Commander-In-Chief allowed them to be used in manner that was totally outside the implied contract of their military service. And, we think it is fair to say, the congress failed to protect these servicemen while exercising their oversight responsibilities in the various committees designated to monitor these kinds of activities.

### III CONCLUSIONS AND RECOMMENDATIONS

We believe the evidence demonstrates that the atomic veterans were part of an on-going experiment involving their biological and psychological reactions to explosions of nuclear and thermonuclear devices. They were improperly advised that their participation involved no personal risk and there was an egregious error in at least not warning them, upon their separation from service, that on-going medical check-ups would be wise given the higher risk they now faced due to radiation exposure.

We have watched and/or learned of families disintegrating due to the husband's illnesses and deaths starting as early as the late 1940s. We have heard of bankruptcies, divorces, sick and dead children and suicides. More poignant perhaps has been the loss of faith and trust these men, or their family members, had in our country in terms of doing the right thing. More than a denial of a pension or health care, these citizens have felt betrayed and denigrated by the total denial of the legitimacy of what they believe has happened to them and by those who try to label them as people looking for a handout.

More than anything, these men and their families want justice.

Pass Representative Lane Evans' bill with the modifications we suggest. Take the time to read the Advisory Committee report, particularly as it pertains to atomic veterans. Then sit down with atomic veterans, objective scientists, the DVA, the White House and whomever else is appropriate and end this issue once and for all by ensuring justice, as defined by those harmed, is finally provided these courageous veterans and their families.

You may be surprised. Justice for these people does not always translate into dollars.

April 30th, 1996

The Honorable Congress Member Terry Everett  
Chairman, Subcommittee on Compensation, Pension,  
Insurance and Memorial Affairs

and

The Honorable Congress Member Lane Evans  
Ranking Democratic Member of Subcommittee on Compensation,  
Pension, Insurance and Memorial Affairs

**TESTIMONY OF ACIE LEE BYRD, JR.  
ON BEHALF OF THE ATOMIC VETERANS WORKING GROUP**

which consists of the principle three organized Atomic Veteran Associations:

- a) The Alliance of Atomic Veterans;
- b) National Association of Atomic Veterans;
- c) National Association of Radiation Survivors

On February 26, 1996 the three groups formulated a collective position that reflects our common concerns regarding the medical conditions of the nation's atomic veterans; and the inadequate remedies developed by the United States Government, thus far.

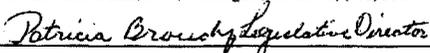
We have drawn from over three decades of discussions, pain and suffering, scientific research, legislative hearing, a body of principles and remedial proposal, which we feel reflects the collective wisdom and experience of the atomic veterans and their families of our great country. We would like to, respectfully, submit the following ten (10) points for your review and deliberation:

**ATOMIC VETERANS' WORKING GROUP RECOMMENDATIONS**

1. All radiation victims be compensated for the same radiogenic illnesses and in the same amount -- regardless of site of exposure and that all such illnesses be presumptive.
2. That all classified service and medical records of atomic veterans be immediately declassified. (Proof can be furnished of two sets of medical records for atomic veterans.)
3. The 11 other additional radiation risk activities revealed by the Veterans Affairs Committee on Environmental Hazards, August 1993, be included for consideration in the existing laws and any future laws pertaining to atomic veterans, without time constraints.
4. That the radioepidemiological tables be eliminated as a source of reliance by the VA in determining a veteran's/survivor's entitlement to service connection.
5. We recommend that all persons covered under RECA be awarded the highest sum (\$100,000) now awarded only to uranium miners, with no offsets or restrictions.
6. After all radiogenic illnesses listed in P.L. 98-542 have become presumptive--that P.L. 98-542 be repealed in its entirety. That any illnesses determined by a competent physician to be radiogenic, shall be added to the presumptive list.
7. That survivors of Atomic Veterans who did not receive care in military or VA hospitals/clinics, be awarded monetary sums expended by them for the care, treatment, hospitalization and other expenses suffered by those survivors in today's dollars. That all survivors receive compensation for loss of earnings and other expenses incurred as a result of the veteran's fatal illness, if the veteran died of a disability as listed in P.L. 100-321-102-578 or any illness found to be radiogenic in the future. That this remuneration (as suggested in the Report of the Advisory Committee) be in addition to DIC (survivors' benefits) and not subject to any other offset for Social Security benefits or governmental benefits received as a result of the veteran's illness. Priority care in VA hospitals must be on a continuing basis and not subject to yearly renewal.
8. Onsite presence at a test site will be presumed for compensation purposes in the absence of evidence to the contrary.
9. That a registry be established for the offspring of atomic veterans who may have developed genetic health problems as a result of his/her parents' or grandparents' exposure to ionizing radiation, and compensation paid for their care.
10. Atomic veterans must be accorded positions on the Bioethics Committee and any future committees related to exposure to ionizing radiation.



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**Task Force on Radiation and Human Rights**

Washington D.C. Office:  
National Committee for Radiation Survivors  
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April 30, 1996

**BEFORE THE HOUSE VETERANS AFFAIRS SUBCOMMITTEE  
ON COMPENSATION, PENSION, INSURANCE AND MEMORIAL AFFAIRS**

**Concerning the Report of the President's Advisory Committee  
on Human Radiation Experiments and the Atomic Veterans**

Dear Chairman Everett and Members of the Subcommittee:

The Final Report of the President's Advisory Committee on Human Radiation Experiments documents that in September of 1951, the military's Joint Panel on the Medical Aspects of Atomic Warfare considered a proposal for "biomedical participation" in future nuclear weapons bomb tests. Twenty-nine problem areas were identified as examples of "the types of problems which should be considered as a legitimate basis for biomedical participation in future weapons tests." Included within that listing were proposals for research on:

- \* psychological testing and experimentation;
- \* flash blindness experiments;
- \* aircrew atomic cloud fly-through experiments;
- \* "atomic effects" experiments;
- \* body fluid sampling to determine fallout ingestion;
- \* radiation exposures research on protective clothing and equipment;
- \* decontamination experiments.

The Advisory Committee documents that each and every one of these experiments, and more, were subsequently conducted on Atomic Veterans during the atmospheric nuclear weapons testing program, beginning at Desert Rock I in November of 1951, just two months after the Joint Panel's consideration of the foregoing proposal.

• Alliance of Atomic Veterans • American Environmental Health Studies Project • Atomic Reclamation & Conversion Project • Center for Atomic Radiation Studies • Cincinnati Families of Radiation Victims Organization • Citizens Call • Citizen Soldier • Colorado Atomic-Agent Orange Veterans Coalition • Committee of Atomic Bomb Survivors in the USA • Concerned Relatives of Cancer Study Patients • Fernald School "Science Club" • Hanford Downwinders Health Concerns • Hiroshima/Nagasaki Peace Committee • Indigent Transients & Survivors of Oak Ridge • Laguna-Acoma Coalition for a Safe Environment • National Association of Atomic Veterans • National Association of Radiation Survivors • National Committee for Radiation Victims • Native Alaskans of Point Hope • Navajo Uranium Radiation Victims Committee • Oak Ridge Health Liaison • Oregon State Prison Experiment Victims • Portsmouth-Piketon Residents for Environmental Safety & Security • Rochester Radiation Victims/Survivors Association • Survivors of Medical Radiation Experiments • Trinity Post 7-45 • Vanderbilt Irradiated Victims Organization •

However, for those of us who have been deeply involved in the atomic veteran issue over the last dozen years or more, we find within the report's 900+ pages the alarming suggestion that an additional purpose in the mass deployment of military personnel at the Nevada and Pacific test sites was to determine the ability of troops to fulfill simulated combat and post-combat objectives after having been purposefully subjected to varying and increasingly higher levels of radiation generated from the detonation of nuclear weapons -- in other words, human experimentation on uninformed, unsuspecting and nonconsenting military personnel.

Chapter 10 of the Advisory Committee's report is devoted entirely to the atomic veterans. However, only a portion of what may be the most important aspect of the atomic veteran story is found at Chapter 10. Reading the atomic veterans' chapter together with the Introductory Chapter (beginning at page 38) and, to a lesser extent, Chapter 8 on Total Body Irradiation (pp. 374-377), provides a glimpse of something the atomic veterans have long feared might well have been the case at the nuclear weapons test sites: There, quoting from previously classified documents, we find the initial discussions between the military and the AEC scientists about the adverse effects to troops of nuclear warfare. General Cooney notes that the military wants to know what would happen to troops deployed on the battlefield in the event a tactical nuclear weapon exploded in their midst. The AEC scientists did not have a good answer. General Cooney suggests the need for experimentation on healthy volunteers "both officers and enlisted" involving upwards of 150R whole body irradiation. The scientists argued against this and, so it is suggested by the Committee report, the scientists won the argument. The military, so the Committee concludes, did not do as Cooney had suggested but instead went off and did whole body radiation experiments on unsuspecting patients.

We submit to you that the Advisory Committee's interpretation of what subsequently transpired may well be in error. Certainly the military did go off and do radiation experiments on hospital patients; but no evidence was produced by the Advisory Committee (that we are aware of) to support its conclusion that the military officials gave up on their desire to learn what would happen to troops actually deployed on the nuclear battlefield. Nor for a moment does the Task Force believe that military officials would let a bunch of AEC scientists not only stand in the way of the military's need to know but, as General Cooney put it, thwart the military's "tradition of experimentation with healthy volunteers."

The Task Force submits to this committee the following thesis for consideration: That commencing at the Nevada Test Site in 1951, less than a year after the Cooney/AEC discussion quoted in the Advisory Committee's report, Atomic Veterans may have been deployed for the purpose, in part, of determining (as General Cooney had argued was needed) the effect of high levels of radiation on combat troops. This scenario is quite plausible, given what else is known about events during the atmospheric nuclear testing program:

- \* the subsequent debate between the military and the AEC as to how close to place troops to ground zero, and the related debate of what constituted a "safe" dose - with the military always winning even to the point that the AEC finally gives up its protests;

\* the numerous accounts over the years from the men that were stationed at Nevada about physical symptoms immediately after the tests, including nausea, nose bleeds, etc. -- indicia of acute radiation sickness that results from radiation exposures of from 50R to 150R.

In the Atomic Veteran chapter there is a short discussion about events in the mid-1950s wherein those in charge of the bomb tests finally backed off on plans then-brewing to subject "volunteers" to what they called "tolerance" doses by placing them extremely close to ground zero. The Advisory Committee cites this as evidence that doses were kept within safety limits. Again, we read what was really going on differently than the Committee. What we read is that between 1951 and approximately 1956 the Department of Defense, by continuously placing Atomic Veterans closer and closer to ground zero, had come close to reaching "tolerance" dose levels (doses at which immediate physical injury is expected to result). Aware of this, those in command became ever more cautious - turning to true volunteers, most of whom appear to have been officers -- and monitoring ever more carefully as they came closer with each weapons test series to what they considered that "too critical" point -- most likely in the 150R to 175R range.

Certainly the evidence is not complete, such that one could conclude with certainty what really happened on this point. However, we submit to this committee that enough evidence on this issue has been uncovered by the Advisory Committee's investigation to warrant an in-depth Congressional investigation into whether the military did indeed do what General Cooney urged in 1950 be done. (Moreover, the question of experimentation does not end at the Nevada test site. The report reveals that the Navy wanted to know the "risk of sending rescue or salvage parties into contaminated areas." The question in that instance is obviously: whether Navy personnel sent on board radioactive ships at the Pacific test site were sent on board because the military wanted to clean up the ships? or because the military wanted to know the consequences to the men of being stationed on board?)

Respectfully submitted,



E. Cooper Brown  
Task Force Executive Committee  
On behalf of the Task Force on Radiation and Human Rights

enclosure: "About the Task Force"

## **TASK FORCE ON RADIATION AND HUMAN RIGHTS**

### ***ABOUT THE TASK FORCE***

In December of 1993 Secretary of Energy Hazel O'Leary publicly revealed that the Department of Energy's predecessor, the Atomic Energy Commission, had funded and/or sponsored deliberate radiation experiments on unsuspecting U.S. citizens during the years of the Cold War. Since Secretary O'Leary's initial announcement, the officially disclosed number of human radiation experiments conducted by all federal agencies during the 1940s, 1950s and 1960s has grown to over 4,000. The experiments were conducted on unsuspecting individuals without their consent. The victims were not in a position to protect themselves. More often than not the people subjected to the experiments were the poor and uneducated, people of African-American descent, the mentally retarded, and prisoners.

In response to these revelations, the leadership of the radiation victims/survivors community and representatives of the victims of government-sponsored Cold War era radiation experiments initiated the **Task Force on Radiation and Human Rights**, a collaborative project of over two dozen radiation survivors and experiment victims groups and organizations. A complete listing of the experiment victims groups, radiation survivors groups, and public interest organizations comprising the Task Force is attached. The purpose and goals of the Task Force include:

- (1) Ensuring full public disclosure of all human radiation experiments in which the U.S. Government has been involved;
- (2) ensuring that all of those who were the subject of these experiments (and/or their families) are located and warned;
- (3) ensuring that medical care is provided to those victims still living and that impacted families receive psychological and emotional support;
- (4) ensuring that just compensation is provided to the experiment victims and their families and that, to this end, the victims' rights in court are preserved;
- and (5) ensuring that institutional safeguards are put in place to prevent unethical human experimentation from ever again being conducted by or in the United States.

The *Task Force's* primary focus has been outreach to find and warn the experiment victims and their families. To this end, the Task Force has hosted public information and organizing meetings in conjunction with hearings conducted the last year by the President's Advisory Committee on Human Radiation Experiments. With the recent conclusion of the Advisory Committee's investigation and release of its final report (October 3rd), the Task Force is turning its attention to ensuring that the federal government's response to the various recommendations that have been made by the Advisory Committee are implemented consistent with the needs and concerns of those most directly affected – the experiment victims and their families. Essential to this effort, the Task Force has begun planning for a national radiation leadership and human rights conference, designed to broaden the base of support for needed institutional reform. From the Task Force's perspective, such reform must both respond to dictates of justice for past victims and, equally important, ensure for the future that similar human experimentation, regardless of the perceived national need or political context, is never again allowed to take place.

Washington D.C. Office: **NATIONAL COMMITTEE FOR RADIATION VICTIMS**  
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**STATEMENT OF MR. R. J. VOGEL  
UNDER SECRETARY FOR BENEFITS  
VETERANS BENEFITS ADMINISTRATION  
DEPARTMENT OF VETERANS AFFAIRS  
BEFORE THE  
SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE AND  
MEMORIAL AFFAIRS  
HOUSE OF REPRESENTATIVES  
APRIL 30, 1996**

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss eligibility for VA benefits and services based upon disabilities and deaths which may be related to veterans' ionizing-radiation exposure during service.

Service connection for radiation-related disabilities or deaths is established under either the statutory presumptions created by Public Law 100-321 or regulations VA has promulgated pursuant to Public Law 98-542.

To be more specific, in Public Law 98-542, enacted on October 24, 1984, Congress instructed VA to issue regulations ensuring compensation to veterans and their survivors for disabilities or deaths related to exposure to ionizing radiation. On September 25, 1985, VA published 38 CFR 3.311b, now designated section 3.311. This regulation contains the procedures for establishing service connection for disabilities or deaths when the underlying disease first appears after service but not during any applicable statutory presumptive period.

If the asserted radiation exposure is from atmospheric testing or the postwar occupation of Nagasaki and Hiroshima, VA's source for dose information is the Defense Nuclear Agency. If other types of exposure are involved, VA has responsibility for preparing a dose estimate from any

available official military records. In all situations, however, a claimant is permitted to submit an alternative dose estimate from a credible source (a person certified to have the requisite scientific expertise).

When it is necessary to reconcile a material difference between the dose estimate developed from official military records and that provided by a credible source acting on behalf of a claimant, VA may obtain a separate estimate from an independent expert selected by the Director of the National Institutes of Health.

When it is established that radiation exposure occurred in service and a radiogenic disease has been suffered within certain time limits, the claim is referred to VA's Central Office for review and an advisory opinion from the Director of the Compensation and Pension Service. This advisory opinion contains the rationale as to whether it is at least as likely as not that the claimed disease resulted from radiation exposure. A positive finding in this regard is adequate to support service connection. Prior to issuing an opinion, however, the Director of the Compensation and Pension Service may obtain the advice of the Chief Public Health and Environmental Hazards Officer.

The procedures established by section 3.311 provide criteria for reviewing claims in which service connection cannot be established under other provisions of the statute and regulations. By taking into account the unique facts of each individual case, including radiation dose estimate, VA is able to award benefits whenever diseases or deaths may be reasonably associated with in-service radiation exposure. Currently, section 3.311 specifies 22 radiogenic diseases and the time periods within which each must occur but also provides for consideration of other diseases shown by competent scientific or medical evidence to be radiogenic.

Section 3.311 does not provide compensation on a presumptive basis. However, the "Radiation-Exposed Veterans' Compensation Act of 1988," Public Law 100-321, authorized compensation on a presumptive

basis for certain radiation-exposed veterans who developed one of 13 specified diseases to a degree of 10 percent or more within 40 years following exposure.

The radiation-exposed veterans covered are those who participated in radiation risk activities during service. This means that the individual was either: (1) an on-site participant at the U.S. atmospheric detonation of a nuclear device; (2) a member of the United States occupation forces of Hiroshima or Nagasaki, Japan, during the period August 6, 1945, through July 1, 1946; or, (3) an internee as a prisoner of war in Japan during World War II. As a result of a provision of Public Law 103-446, VA published an amendment to 38 CFR 3.309(d) on June 14, 1995, to include as a radiation-risk activity atmospheric nuclear testing by any nation.

The "Veterans' Radiation Exposure Amendments of 1992," Public Law 102-578, added cancers of the salivary gland and urinary tract to the list of presumptively service-connected radiogenic diseases. It also removed the requirement that a disease must have appeared to a degree of 10 percent or more within 40 years after exposure.

One other noteworthy provision of Public Law 98-542 is its authorization of the Veterans Advisory Committee on Environmental Hazards (VACEH). The VACEH advises VA on the relationships of various diseases to radiation exposure. Recently, the VACEH recommended that prostate cancer be added to the list of conditions that may result from radiation exposure. We are in the process of proposing a rule change to implement the Committee's recommendation.

Last fall the Advisory Committee on Human Radiation Experiments presented to President Clinton its report, which included a recommendation that VA consider the feasibility of updating and expanding the radio-epidemiological tables that we rely upon to determine the likelihood that certain diseases could result from exposure to ionizing radiation. The Advisory Committee further recommended that

VA review existing laws and regulations that govern compensation. In response to the Advisory Committee's recommendations, VA Secretary Jesse Brown along with his colleagues Secretary of Defense William Perry and Secretary of Health and Human Services Donna Shalala appointed representatives to the VA Human Radiation Interagency Working Group, which I chair. Our specific mission, as members of this Working Group, is to respond to the Advisory Committee on Human Radiation Experiments. The Working Group recently met, and we are beginning to formulate a response to the Advisory Committee's recommendations.

I would next like to mention the medical treatment and other health care services available to radiation-exposed veterans.

Currently, VA provides veterans exposed to ionizing radiation as a result of participation in atmospheric tests or the occupation of Hiroshima and Nagasaki with free, comprehensive medical examinations, including base-line laboratory tests and other diagnostic tests deemed by an examining physician necessary to determine current health status. Results of the examination, which include preparation of the veteran's military service and exposure history, are entered into a special, computerized program known as VA's Ionizing Radiation Registry. These data assist VA in analyzing the types of health conditions being reported by veterans. Registry participants are advised of the results of their examinations in personal consultations. Veterans who were exposed to radiation in these circumstances may participate in the Registry program regardless of whether they have ever filed a claim for disability benefits. Veterans wishing to participate in the registry program should contact the nearest VA health-care facility to request an examination.

Even more significantly, since 1981 these same veterans have been eligible for VA health care for all conditions except those that VA affirmatively determines have causes other than their radiation exposure.

Mr. Chairman, there is no doubt that these individuals have sacrificed for the welfare of our country and it is our job to see that their sacrifices are appropriately recognized. We are privileged to administer programs to benefit them and their families and would be pleased to answer any questions.

**STATEMENT OF JOAN MA PIERRE  
DIRECTOR FOR ELECTRONICS AND SYSTEMS  
DEFENSE NUCLEAR AGENCY**

**BEFORE THE  
HOUSE VETERANS' AFFAIRS COMMITTEE  
COMPENSATION, PENSION, INSURANCE, AND  
MEMORIAL AFFAIRS SUBCOMMITTEE  
APRIL 30, 1996**

Good morning, Mr. Chairman and Members of the Subcommittee. I am Joan Ma Pierre, Director for Electronics and Systems at the Defense Nuclear Agency (DNA). DNA is the Department of Defense's (DoD) Executive Agent for the Nuclear Test Personnel Review (NTPR) program. Separate from my position at DNA, I am also the Director for the DoD Radiation Experiments Command Center (RECC), which was created in 1994 in response to the President's initiative to make information available to the public about Cold War era human radiation experiments. Thank you for the opportunity to describe the NTPR program and how it relates to compensation programs administered by the Department of Veterans Affairs (VA) and Department of Justice (DOJ). Additionally, I will comment on DoD support to the Interagency Working Group on Human Radiation Experiments and the Working Group's response to recommendations made by the White House Advisory Committee on Human Radiation Experiments (ACHRE).

Since its beginning in 1978, the NTPR program has identified approximately 210,000 DoD personnel, who participated in U.S. atmospheric nuclear tests that were conducted in the continental United States and the Pacific and Atlantic Oceans prior to the 1963 Limited Test Ban Treaty. In 1988, Congress directed that approximately 195,000 DoD veterans, who participated in the post-World War II occupation of Hiroshima and Nagasaki, Japan, be added to the program. Ten public laws, enacted between 1981 and 1994, provide the basis

for medical care and compensation entitlement for radiation exposed veterans. The VA and DOJ are solely responsible for reviewing claims, determining eligibility, and administering benefits. DNA plays no role in the claims adjudication process. DNA supports VA and DOJ in two areas: verification of individual participation in testing and provision of radiation doses. When requested by the VA and DOJ, DNA provides the verification and, if required, the radiation dose for the adjudication of veteran claims.

If a veteran's claim to the VA or DOJ requires information on the radiation dose received, original exposure data, if available, are used. If the data do not fully represent the veteran's possible exposure to radiation, we rely on the best scientific techniques available to reconstruct the dose. Dose reconstruction provides the veteran with a calculated dose representative of activities which could not be accounted for in the original exposure data. For example, because doses were not recorded at the time, the 195,000 Hiroshima/Nagasaki participants receive reconstructed doses to account for their potential exposure to radiation. About 50 percent of the 210,000 U.S. atmospheric nuclear test participants get all or part of their doses from reconstructions.

DNA has expended approximately \$102.5M (then-year dollars) since 1978 to support veterans under the NTPR Program. Less than one-seventh of the total program cost has been spent for dose reconstruction. About half the program funding was spent up-front for archival research to locate, retrieve, declassify as necessary, and preserve the original records. Histories of the tests and participating military units had to be developed, personnel activities and radiation safety practices documented, and a database created to capture and track all relevant information. These labor intensive and time consuming tasks were required to document veteran participation at nuclear events and to establish individual radiation doses.

The bulk of the archival research component was completed by 1984. Since that time, the program has focused primarily on public outreach service. To establish personal contact with as many veterans as possible, DNA conducted mass mailings to publicize the

services of the NTPR program and the availability of health care and entitlement programs. A toll-free help line (1-800-462-3683), installed in the program's early days, continues to allow the veterans to contact the program directly to receive information about their test participation and answers to their questions. With the enactment of entitlement programs, the NTPR program has become the primary channel for veterans, their families, and the VA and DOJ to obtain verification of individual participation and personal dose information or general information about testing events.

I would also like to comment on the DoD role in the recent government-wide openness initiative to find, declassify, and make publicly available government records related to human radiation experimentation. In January 1994, President Clinton established the Human Radiation Interagency Working Group to coordinate the Federal Government's efforts to provide the public with a full accounting of government-sponsored radiation experiments. The Advisory Committee on Human Radiation Experiments (ACHRE), established by Executive Order, reviewed experiments conducted from 1944 to 1974 (later extended to include the present), evaluated ethical and scientific standards and criteria on human radiation experiments conducted or sponsored by the U.S. Government, and prepared a final report of its findings and recommendations to the President.

The DoD Radiation Experiments Command Center (RECC) was established in early February 1994 to serve as the central repository for DoD information relating to human radiation experiments (HRE). It coordinated the DoD search, review, collection and declassification of relevant material; created a database catalog of HRE records; and continues to respond to Congressional and public inquiries. The RECC also conducted extensive research and review of relevant documents at National Archives and Federal Records Centers throughout the U.S. and coordinated the declassification of more than 1,200 documents. From this effort, the RECC identified approximately 2,600 instances where human subjects possibly were exposed to radiation. This latter number is high due to the DoD policy to err on the side of inclusion. Since its inception, the RECC has received more than 7,000 public and 350 Congressional inquiries. To ensure future access to HRE data,

the DoD is currently digitizing more than 250,000 pages of human radiation experiment documents for access on the Internet.

Finally, in response to Recommendation 6 of the Advisory Committee on Human Radiation Experiments, the DoD is an active participant in support of the VA Human Radiation Interagency Working Group. The Working Group is addressing the recommendation to update the radioepidemiological tables used by the VA to relate the probability of diseases being caused by exposure to ionizing radiation. It is also evaluating the efficacy of current programs relating to radiation-exposed veterans. DoD will continue to support these important initiatives.

*I appreciate the opportunity to represent the Defense Nuclear Agency and Department of Defense before the Subcommittee. This concludes my testimony. I will be pleased to answer any questions you may have.*

**JOAN MA PIERRE**

I am Dr. Ruth R. Faden, Philip Franklin Wagley Professor of Biomedical Ethics and Director, The Bioethics Institute of the Johns Hopkins University. This morning I am appearing in my role as Chair of the Advisory Committee on Human Radiation Experiments, appointed by President Clinton in January of 1994. The members of the Advisory Committee were fourteen private citizens from around the country: a representative of the general public and thirteen experts in bioethics, radiation oncology and biology, nuclear medicine, epidemiology and biostatistics, public health, history of science and medicine, and law. For your convenience, I have appended the Executive Summary of our Report, which summarizes the origins of the Committee, our charge and approach, and our key findings and recommendations.

I have also appended a copy of Chapter 10, "Atomic Veterans: Human Experimentation in Connection with Bomb Tests," of our Final Report, as well as a copy of the Committee's recommendations concerning fair treatment of atomic veterans.

The Committee was not chartered to review the atomic bomb tests or the experience of the troops present at the detonations. However, early in our tenure we heard from veterans who participated in the tests, and their family members, who urged that we include their experiences in our review. In testimony before the Advisory Committee, "atomic vets" and their widows stated forcefully that all those who participated in the bomb tests were in a real sense participants in an experiment. It also was argued that biomedical experiments involving military personnel as human subjects took place in connection with the tests. The interest among atomic veterans and their families in the activities of the Advisory Committee and the government's commitment to investigating human radiation experiments was intense. When the Department of Energy established its Help line for citizens concerned about human radiation experiments, for example, bomb-test participants and their family members were the single largest group of callers among the approximately 20,000 calls received.

The Committee reviewed the historical record to determine if human experiments had taken place in connection with the tests. We found that somewhere in the range of 2,000 to 3,000 military personnel at the tests did serve as the subjects of research in connection with the tests. In most cases, these research subjects were engaged in activities similar to those engaged in by the approximately 200,000 other service personnel who were not research subjects. For example, some air crew flew through atomic clouds in experiments to measure radiation absorbed by their bodies, but many others flew in or around atomic clouds to gather data on radiation in the clouds. The Defense Department generally did not distinguish such research from otherwise similar activities, treating both as part of the duties of military personnel. The experience of the

atomic veterans illustrates well the difficulty in locating the boundary between research involving human subjects and other activities conducted in occupational settings that routinely involve exposure to hazards.

The more the Committee investigated the human research projects conducted in conjunction with the bomb tests, the more we found ourselves discussing issues that affected all the service personnel who had been present at the tests, and not just those who also had been involved as subjects of research. This occurred both because of the boundary problem just described and because critical decisions about initial exposure levels and follow-up of veterans were generally not made separately for research subjects and other personnel present at the tests. Legislation passed in 1984 and 1988 that provides the basis for compensation to some atomic veterans similarly does not distinguish between those veterans who were research subjects and the vast majority who were not.

Perhaps most relevant to this hearing, the Committee also found that the government did not create or maintain adequate records for both experimental and nonexperimental participants.

Based on our examination of the record, the Committee made the following recommendations:

**The Advisory Committee recommends to the Human Radiation Interagency Working Group that it, together with Congress, give serious consideration to reviewing and updating epidemiological tables that are relied upon to determine whether relief is appropriate for veterans who participated in atomic testing so that all cancers or other diseases for which there is a reasonable probability of causation by radiation exposure during active military service are clearly and unequivocally covered by the statutes.**

Congress has provided for compensation for veterans who participated in atmospheric atomic tests or the American occupation of Hiroshima or Nagasaki, Japan. The provision of compensation depends on evidence that the veteran has sustained disability from a disease that may be related to radiation exposure.

The Veterans Dioxin and Radiation Exposure Compensation Standards Act of 1984 required the Veterans Administration to write a rule governing entitlement to compensation for radiation-related disabilities. The resulting regulation contains criteria for adjudicating radiation claims, including consideration of a radiation-dose estimate and a determination as to whether it is at least as likely as not that the claimed disease resulted from radiation exposure. The Radiation-Exposed Veterans Compensation Act of 1988 provides that a veteran who was present at a designated event and subsequently develops a designated radiogenic disease may be entitled to benefits without having to prove causation.<sup>1</sup>

The Committee recommends that the radioepidemiological tables prepared by the National Institutes of Health in 1985, which identify diseases that may be causally connected to radiation exposures, be updated. The Committee understands that the Department of Veterans Affairs agrees with this recommendation.

**The Advisory Committee further recommends to the Human Radiation Interagency Working Group that it review whether existing laws governing the compensation of atomic veterans are now administered in ways that best balance allocation of resources between financial compensation to eligible atomic veterans and administrative costs, including the costs and scientific credibility of dose reconstruction.**

While the Committee's inquiry focused on participants at atmospheric testing who were subjects of experimentation, the Committee found that the risks to which experimental subjects were exposed were typically similar to those to which many other test participants were subjected. Those service members who were participants in the experiments reviewed by the Advisory Committee would, as veterans of atmospheric atomic tests, be eligible for relief under the laws enacted in 1984 and 1988, as amended, concerning radiation-exposed veterans.

The Committee found that the government did not create or maintain adequate records regarding the exposures of all participants, the identity and test locale of all participants, and the follow-up, to the extent it took place, of test participants. Witnesses before the Advisory Committee, and others who communicated with us by mail, telephone, and personal visit, expressed strong concerns about the adequacy and operation of the current laws, including, specifically, record-keeping practices. Although the Committee did not have the time or resources to pursue these concerns to the degree they merit, we believe that the concerns expressed by veterans and their family members deserve attention, and we urge the Human Radiation Interagency Working Group in conjunction with Congress to address these concerns promptly. The concerns reported to us include the following:

1. The listing of diseases for which relief is automatically provided--the "presumptive" diseases provided for in the 1988 law--is incomplete and inadequate.
2. The standard of proof for those without a presumptive disease is impossible to meet and, given the questionable condition of the exposure records retained by the government, inappropriate.

3. The statutes are limited and inequitable in their coverage; for example, the inclusion of those exposed at atmospheric tests does not protect those who were exposed to equal amounts of radiation in activities such as cleanup at Enewetak atoll.
4. The time and expense needed to prosecute a claim is too great. For example, veterans whose claims are initially denied at the VA regional offices and are seeking appeal of the initial decision receive a form letter stating that it will take at least twenty-four months to process their appeal.
5. Time and money spent on contractors and consultants in administering the program would be better spent on directly aiding veterans and their survivors.

These recommendations were recently endorsed by Mrs. Pat Broudy, speaking on behalf of the National Association of Atomic Veterans.. Mrs. Broudy, a widow of an atomic veteran, is the Legislative Director of the NAAV. (Human Radiation Experiments: Stakeholders Workshop, 2/26- 2/27, 1996.)

I am grateful to have had this opportunity to present before the Subcommittee on Compensation, Pension, Insurance and Memorial Affairs of the Committee on Veterans Affairs and hope you will look favorably, and act upon, our recommendations.

**Executive Summary  
and  
Guide to Final Report**  

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*Advisory  
Committee  
on  
Human Radiation  
Experiments*

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*Advisory Committee on Human  
Radiation Experiments*

**FINAL REPORT**

**EXECUTIVE SUMMARY**

**AND**

**GUIDE TO FINAL REPORT**

**Executive Summary**

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The Final Report of the Advisory Committee on Human Radiation Experiments (stock number 061-000-00-848-9), the supplemental volumes to the Final Report (stock numbers 061-000-00850-1, 061-000-00851-9, and 061-000-00852-7), and additional copies of this Executive Summary (stock number 061-000-00849-7) may be purchased from the Superintendent of Documents, U.S. Government Printing Office.

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An Internet site containing ACHRE information (replicating the Advisory Committee's original gopher) will be available at George Washington University. The site contains complete records of Advisory Committee actions as approved; complete descriptions of the primary research materials discovered and analyzed; complete descriptions of the print and non-print secondary resources used by the Advisory Committee; a copy of the Interim Report of October 21, 1994, and a copy of the Final Report; and other information. The address is <http://www.seas.gwu.edu/nsarchive/radiation>. The site will be maintained by the National Security Archive at GWU.

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## **THE CREATION OF THE ADVISORY COMMITTEE**

On January 15, 1994, President Clinton appointed the Advisory Committee on Human Radiation Experiments. The President created the Committee to investigate reports of possibly unethical experiments funded by the government decades ago.

The members of the Advisory Committee were fourteen private citizens from around the country: a representative of the general public and thirteen experts in bioethics, radiation oncology and biology, nuclear medicine, epidemiology and biostatistics, public health, history of science and medicine, and law.

President Clinton asked us to deliver our recommendations to a Cabinet-level group, the Human Radiation Interagency Working Group, whose members are the Secretaries of Defense, Energy, Health and Human Services, and Veterans Affairs; the Attorney General; the Administrator of the National Aeronautics and Space Administration; the Director of Central Intelligence; and the Director of the Office of Management and Budget. Some of the experiments the Committee was asked to investigate, and particularly a series that included the injection of plutonium into unsuspecting hospital patients, were of special concern to Secretary of Energy Hazel O'Leary. Her department had its origins in the federal agencies that had sponsored the plutonium experiments. These agencies were responsible for the development of nuclear weapons and during the Cold War their

activities had been shrouded in secrecy. But now the Cold War was over.

The controversy surrounding the plutonium experiments and others like them brought basic questions to the fore: How many experiments were conducted or sponsored by the government, and why? How many were secret? Was anyone harmed? What was disclosed to those subjected to risk, and what opportunity did they have for consent? By what rules should the past be judged? What remedies are due those who were wronged or harmed by the government in the past? How well do federal rules that today govern human experimentation work? What lessons can be learned for application to the future? Our Final Report provides the details of the Committee's answers to these questions. This Executive Summary presents an overview of the work done by the Committee, our findings and recommendations, and the contents of the Final Report.

## **THE PRESIDENT'S CHARGE**

The President directed the Advisory Committee to uncover the history of human radiation experiments during the period 1944 through 1974. It was in 1944 that the first known human radiation experiment of interest was planned, and in 1974 that the Department of Health, Education and Welfare adopted regulations governing the conduct of human research, a watershed event in the history of federal protections for human subjects.

In addition to asking us to investigate human radiation experiments, the President directed us to examine cases in which the government had intentionally released radiation into the

environment for research purposes. He further charged us with identifying the ethical and scientific standards for evaluating these events, and with making recommendations to ensure that whatever wrongdoing may have occurred in the past cannot be repeated.

We were asked to address human experiments and intentional releases that involved radiation. The ethical issues we addressed and the moral framework we developed are, however, applicable to all research involving human subjects.

The breadth of the Committee's charge was remarkable. We were called on to review government programs that spanned administrations from Franklin Roosevelt to Gerald Ford. As an independent advisory committee, we were free to pursue our charge as we saw fit. The decisions we reached regarding the course of our inquiry and the nature of our findings and recommendations were entirely our own.

## **THE COMMITTEE'S APPROACH**

At our first meeting, we immediately realized that we were embarking on an intense and challenging investigation of an important aspect of our nation's past and present, a task that required new insights and difficult judgments about ethical questions that persist even today.

Between April 1994 and July 1995, the Advisory Committee held sixteen public meetings, most in Washington, D.C. In addition, subsets of Committee members presided over public forums in cities throughout the country. The Committee heard from more than 200 witnesses and interviewed dozens of

professionals who were familiar with experiments involving radiation. A special effort, called the Ethics Oral History Project, was undertaken to learn from eminent physicians about how research with human subjects was conducted in the 1940s and 1950s.

We were granted unprecedented access to government documents. The President directed all the federal agencies involved to make available to the Committee any documents that might further our inquiry, wherever they might be located and whether or not they were still secret.

As we began our search into the past, we quickly discovered that it was going to be extremely difficult to piece together a coherent picture. Many critical documents had long since been forgotten and were stored in obscure locations throughout the country. Often they were buried in collections that bore no obvious connection to human radiation experiments. There was no easy way to identify how many experiments had been conducted, where they took place, and which government agencies had sponsored them. Nor was there a quick way to learn what rules applied to these experiments for the period prior to the mid-1960s. With the assistance of hundreds of federal officials and agency staff, the Committee retrieved and reviewed hundreds of thousands of government documents. Some of the most important documents were secret and were declassified at our request. Even after this extraordinary effort, the historical record remains incomplete. Some potentially important collections could not be located and were evidently lost or destroyed years ago.

Nevertheless, the documents that were recovered enabled us to identify nearly 4,000 human radiation experiments sponsored

by the federal government between 1944 and 1974. In the great majority of cases, only fragmentary data was locatable; the identity of subjects and the specific radiation exposures involved were typically unavailable. Given the constraints of information, even more so than time, it was impossible for the Committee to review all these experiments, nor could we evaluate the experiences of countless individual subjects. We thus decided to focus our investigation on representative case studies reflecting eight different categories of experiments that together addressed our charge and priorities. These case studies included:

- experiments with plutonium and other atomic bomb materials
- the Atomic Energy Commission's program of radioisotope distribution
- nontherapeutic research on children
- total body irradiation
- research on prisoners
- human experimentation in connection with nuclear weapons testing
- intentional environmental releases of radiation
- observational research involving uranium miners and residents of the Marshall Islands

In addition to assessing the ethics of human radiation experiments conducted decades ago, it was also important to explore the current conduct of human radiation research. Insofar as wrongdoing may have occurred in the past, we needed to examine the likelihood that such things could happen today. We therefore undertook three projects:

- A review of how each agency of the federal government that currently conducts or funds research involving human subjects regulates this activity and oversees it.
- An examination of the documents and consent forms of research projects that are today sponsored by the federal government in order to develop insight into the current status of protections for the rights and interests of human subjects.
- Interviews of nearly 1,900 patients receiving out-patient medical care in private hospitals and federal facilities throughout the country. We asked them whether they were currently, or had been, subjects of research, and why they had agreed to participate in research or had refused.

## **THE HISTORICAL CONTEXT**

Since its discovery 100 years ago, radioactivity has been a basic tool of medical research and diagnosis. In addition to the many uses of the x ray, it was soon discovered that radiation could be used to treat cancer and that the introduction of "tracer" amounts of radioisotopes into the human body could help to diagnose disease and understand bodily processes. At the same time, the perils of overexposure to radiation were becoming apparent.

During World War II the new field of radiation science was at the center of one of the most ambitious and secret research efforts the world has known--the Manhattan Project. Human radiation experiments were undertaken in secret to help under

stand radiation risks to workers engaged in the development of the atomic bomb.

Following the war, the new Atomic Energy Commission used facilities built to make the atomic bomb to produce radioisotopes for medical research and other peacetime uses. This highly publicized program provided the radioisotopes that were used in thousands of human experiments conducted in research facilities throughout the country and the world. This research, in turn, was part of a larger postwar transformation of biomedical research through the infusion of substantial government monies and technical support.

The intersection of government and biomedical research brought with it new roles and new ethical questions for medical researchers. Many of these researchers were also physicians who operated within a tradition of medical ethics that enjoined them to put the interests of their patients first. When the doctor also was a researcher, however, the potential for conflict emerged between the advancement of science and the advancement of the patient's well-being.

Other ethical issues were posed as medical researchers were called on by government officials to play new roles in the development and testing of nuclear weapons. For example, as advisers they were asked to provide human research data that could reassure officials about the effects of radiation, but as scientists they were not always convinced that human research could provide scientifically useful data. Similarly, as scientists, they came from a tradition in which research results were freely debated. In their capacity as advisers to and officials of the government, however, these researchers found that the openness of science now needed to be constrained.

None of these tensions were unique to radiation research. Radiation represents just one of several examples of the exploration of the weapons potential of new scientific discoveries during and after World War II. Similarly, the tensions between clinical research and the treatment of patients were emerging throughout medical science, and were not found only in research involving radiation. Not only were these issues not unique to radiation, but they were not unique to the 1940s and 1950s. Today society still struggles with conflicts between the openness of science and the preservation of national security, as well as with conflicts between the advancement of medical science and the rights and interests of patients.

## **KEY FINDINGS**

### **Human Radiation Experiments**

- Between 1944 and 1974 the federal government sponsored several thousand human radiation experiments. In the great majority of cases, the experiments were conducted to advance biomedical science; some experiments were conducted to advance national interests in defense or space exploration; and some experiments served both biomedical and defense or space exploration purposes. As noted, in the great majority of cases only fragmentary data are available.
- The majority of human radiation experiments identified by the Advisory Committee involved radioactive tracers administered in amounts that are likely to be similar to those used in research today. Most of these tracer studies involved adult subjects and are unlikely to have caused physical harm. However, in some nontherapeutic tracer

studies involving children, radioisotope exposures were associated with increases in the potential lifetime risk for developing thyroid cancer that would be considered unacceptable today. The Advisory Committee also identified several studies in which patients died soon after receiving external radiation or radioisotope doses in the therapeutic range that were associated with acute radiation effects.

- Although the AEC, the Defense Department and the National Institutes of Health recognized at an early date that research should proceed only with the consent of the human subject, there is little evidence of rules or practices of consent except in research with healthy subjects. It was commonplace during the 1940s and 1950s for physicians to use patients as subjects of research without their awareness or consent. By contrast, the government and its researchers focused with substantial success on the minimization of risk in the conduct of experiments, particularly with respect to research involving radioisotopes. But little attention was paid during this period to issues of fairness in the selection of subjects.
- Government officials and investigators are blameworthy for not having had policies and practices in place to protect the rights and interests of human subjects who were used in research from which the subjects could not possibly derive direct medical benefit. To the extent that there was reason to believe that research might provide a direct medical benefit to subjects, government officials and biomedical professionals are less blameworthy for not having had such protections and practices in place.

## **Intentional Releases**

- During the 1944-1974 period, the government conducted several hundred intentional releases of radiation into the environment for research purposes. Generally, these releases were not conducted for the purpose of studying the effects of radiation on humans. Instead they were usually conducted to test the operation of weapons, the safety of equipment, or the dispersal of radiation into the environment.
- For those intentional releases where dose reconstructions have been undertaken, it is unlikely that members of the public were directly harmed solely as a consequence of these tests. However, these releases were conducted in secret and despite continued requests from the public that stretch back well over a decade, some information about them was made public only during the life of the Advisory Committee.

## **Uranium Miners**

- As a consequence of exposure to radon and its daughter products in underground uranium mines, at least several hundred miners died of lung cancer and surviving miners remain at elevated risk. These men, who were the subject of government study as they mined uranium for use in weapons manufacturing, were subject to radon exposures well in excess of levels known to be hazardous. The government failed to act to require the reduction of the hazard by ventilating the mines, and it failed to adequately warn the miners of the hazard to which they were being exposed.

## **Secrecy and the Public Trust**

- The greatest harm from past experiments and intentional releases may be the legacy of distrust they created. Hundreds of intentional releases took place in secret, and remained secret for decades. Important discussion of the policies to govern human experimentation also took place in secret. Information about human experiments was kept secret out of concern for embarrassment to the government, potential legal liability, and worry that public misunderstanding would jeopardize government programs.
- In a few instances, people used as experimental subjects and their families were denied the opportunity to pursue redress for possible wrongdoing because of actions taken by the government to keep the truth from them. Where programs were legitimately kept secret for national security reasons, the government often did not create or maintain adequate records, thereby preventing the public, and those most at risk, from learning the facts in a timely and complete fashion.

## **Contemporary Human Subjects Research**

- Human research involving radioisotopes is currently subjected to more safeguards and levels of review than most other areas of research involving human subjects. There are no apparent differences between the treatment of human subjects of radiation research and human subjects of other biomedical research.
- Based on the Advisory Committee's review, it appears that much of human subjects research poses only minimal risk

of harm to subjects. In our review of research documents that bear on human subjects issues, we found no problems or only minor problems in most of the minimal-risk studies we examined.

- Our review of documents identified examples of complicated, higher-risk studies in which human subjects issues were carefully and adequately addressed and that included excellent consent forms. In our interview project, there was little evidence that patient-subjects felt coerced or pressured by investigators to participate in research. We interviewed patients who had declined offers to become research subjects, reinforcing the impression that there are often contexts in which potential research subjects have a genuine choice.
- At the same time, however, we also found evidence suggesting serious deficiencies in aspects of the current system for the protection of the rights and interests of human subjects. For example, consent forms do not always provide adequate information and may be misleading about the impact of research participation on people's lives. Some patients with serious illnesses appear to have unrealistic expectations about the benefits of being subjects in research.

### **Current Regulations on Secrecy in Human Research and Environmental Releases**

- Human research can still be conducted in secret today, and under some conditions informed consent in secret research can be waived.

- Events that raise the same concerns as the intentional releases in the Committee's charter could take place in secret today under current environmental laws.

### **Other Findings**

The Committee's complete findings, including findings regarding experiments conducted in conjunction with atmospheric atomic testing and other population exposures, appear in chapter 17 of the Final Report.

## KEY RECOMMENDATIONS

### Apologies and Compensation

The government should deliver a personal, individualized apology and provide financial compensation to those subjects of human radiation experiments, or their next of kin, in cases where:

- efforts were made by the government to keep information secret from these individuals or their families, or the public, for the purpose of avoiding embarrassment or potential legal liability, and where this secrecy had the effect of denying individuals the opportunity to pursue potential grievances.
- there was no prospect of direct medical benefit to the subjects, or interventions considered controversial at the time were presented as standard practice, and physical injury attributable to the experiment resulted.

### Uranium Miners

- The Interagency Working Group, together with Congress, should give serious consideration to amending the provisions of the Radiation Exposure Compensation Act of 1990 relating to uranium miners in order to provide compensation to *all* miners who develop lung cancer after some minimal duration of employment underground (such as one year), without requiring a specific level of exposure. The act should also be reviewed to determine whether the documentation standards for compensation should be liberalized.

## **Improved Protection for Human Subjects**

- The Committee found no differences between human radiation research and other areas of research with respect to human subjects issues, either in the past or the present. In comparison to the practices and policies of the 1940s and 1950s, there have been significant advances in the federal government's system for the protection of the rights and interests of human subjects. But deficiencies remain. Efforts should be undertaken on a national scale to ensure the centrality of ethics in the conduct of scientists whose research involves human subjects.
- One problem in need of immediate attention by the government and the biomedical research community is unrealistic expectations among some patients with serious illnesses about the prospect of direct medical benefit from participating in research. Also, among the consent forms we reviewed, some appear to be overly optimistic in portraying the likely benefits of research, to inadequately explain the impact of research procedures on quality of life and personal finances, and to be incomprehensible to lay people.
- A mechanism should be established to provide for continuing interpretation and application in an open and public forum of ethics rules and principles for the conduct of human subjects research. Three examples of policy issues in need of public resolution that the Advisory Committee confronted in our work are: (1) Clarification of the meaning of minimal risk in research with healthy children; (2) regulations to cover the conduct of research with institutionalized children; and (3) guidelines for research with adults

of questionable competence, particularly for research in which subjects are placed at more than minimal risk but are offered no prospect of direct medical benefit.

### **Secrecy: Balancing National Security and the Public Trust**

Current policies do not adequately safeguard against the recurrence of the kinds of events we studied that fostered distrust. The Advisory Committee concludes that there may be special circumstances in which it may be necessary to conduct human research or intentional releases in secret. However, to the extent that the government conducts such activities with elements of secrecy, special protections of the rights and interests of individuals and the public are needed.

*Research involving human subjects.* The Advisory Committee recommends the adoption of federal policies requiring:

- the informed consent of all human subjects of classified research. This requirement should not be subject to exemption or waiver.
- that classified research involving human subjects be permitted only after the review and approval of an independent panel of appropriate nongovernmental experts and citizen representatives, all with the necessary security clearances.

*Environmental releases.* There must be independent review to assure that the action is needed, that risk is minimized, and that records will be kept to assure a proper accounting to the public at the earliest date consistent with legitimate national security concerns. Specifically, the Committee recommends that:

- Secret environmental releases of hazardous substances should be permitted only after the review and approval of an independent panel. This panel should consist of appropriate, nongovernmental experts and citizen representatives, all with the necessary security clearances.
- An appropriate government agency, such as the Environmental Protection Agency, should maintain a program directed at the oversight of classified programs, with suitably cleared personnel.

### **Other Recommendations**

The Committee's complete recommendations, including recommendations regarding experiments conducted in conjunction with atmospheric atomic testing and other population exposures, appear in chapter 18 of the Final Report.

## **WHAT'S NEXT: THE ADVISORY COMMITTEE'S LEGACY**

### **Interagency Working Group Review**

The Interagency Working Group will review our findings and recommendations and determine the next steps to be taken.

### **Continued Public Right To Know**

The complete records assembled by the Committee are available to the public through the National Archives. Citizens wishing to know about experiments in which they, or family members, may have taken part, will have continued access to the Committee's database of 4,000 experiments, as well as the hundreds of thousands of further documents assembled by the Committee. The Final Report contains "A Citizen's Guide to the Nation's Archives: Where the Records Are and How to Find Them." This guide explains how to find federal records, how to obtain information and services from the member agencies of the Interagency Working Group and the Nuclear Regulatory Commission, how to locate personal medical records, and how to use the Advisory Committee's collection.

Supplemental volumes to the Final Report contain supporting documents and background material as well as an exhaustive index to sources and documentation. These volumes should prove useful to citizens, scholars, and others interested in pursuing the many dimensions of this history that we could not fully explore.

*Advisory Committee on Human  
Radiation Experiments*

**GUIDE TO THE REPORT**

The Final Report is written in an easily accessible style, but it is of necessity long. This guide provides a roadmap and capsule descriptions of each section of the report.

## **Preface**

The Preface explains why the Committee was created, the President's charge, and the Committee's approach.

## **Introduction: The Atomic Century**

The Introduction describes the intersection of several developments: the birth and remarkable growth of radiation science; the parallel changes in medicine and medical research; and the intersection of these changes with government programs that called on medical researchers to play important new roles beyond that involved in the traditional doctor-patient relationship. The Introduction concludes with a section titled "The Basics of Radiation Science" for the lay reader.

## **Part I. Ethics of Human Subjects Research: A Historical Perspective**

### **Chapter 1. Government Standards for Human Experiments: The 1940s and 1950s**

In chapter 1 we report what we have been able to reconstruct about government rules and policies in the 1940s and 1950s regarding human experiments. We focus primarily on the Atomic Energy Commission and the Department of Defense, because their history with respect to human subjects research policy is less well known than that of the Department of Health, Education and Welfare (now the Department of Health and

Human Services). Drawing on records that were previously obscure, or only recently declassified, we reveal the perhaps surprising finding that officials and experts in the highest reaches of the AEC and DOD discussed requirements for human experiments in the first years of the Cold War. We also briefly discuss the research policies of DHEW and the Veterans Administration during these years.

## **Chapter 2. Postwar Professional Standards and Practices for Human Experiments**

In chapter 2 we turn from a consideration of government standards to an exploration of the norms and practices of physicians and medical scientists who conducted research with human subjects during this period. We include here an analysis of the significance of the Nuremberg Code, which arose out of the international war crimes trial of German physicians in 1947. Using the results of our Ethics Oral History Project, and other sources, we also examine how scientists of the time viewed their moral responsibilities to human subjects as well as how this translated into the manner in which they conducted their research. Of particular interest are the differences in professional norms and practices between research in which patients are used as subjects and research involving so-called healthy volunteers.

## **Chapter 3. Government Standards for Human Experiments: The 1960s and 1970s**

In chapter 3 we return to the question of government standards, focusing now on the 1960s and 1970s. In the first part of this chapter, we review the well-documented developments that influenced and led up to two landmark events in the history

of government policy on research involving human subjects: the promulgation by DHEW of comprehensive regulations for oversight of human subjects research and passage by Congress of the National Research Act. In the latter part of the chapter we review developments and policies governing human research in agencies other than DHEW, a history that has received comparatively little scholarly attention. We also discuss scandals in human research conducted by the DOD and the CIA that came to light in the 1970s and that influenced subsequent agency policies.

#### **Chapter 4. Ethics Standards in Retrospect**

With the historical context established in chapters 1 through 3, we turn in chapter 4 to the core of our charge. Here we put forward and defend three kinds of ethical standards for evaluating human radiation experiments conducted from 1944 to 1974. These are (1) basic ethical principles that are widely accepted and generally regarded as so fundamental as to be applicable to the past as well as the present; (2) the policies of government departments and agencies at the time; and (3) rules of professional ethics that were widely accepted at the time. We embed these standards in a moral framework intended to clarify and facilitate the difficult task of making judgments about the past.

## **Part II. Case Studies**

### **Chapter 5. Experiments with Plutonium, Uranium, and Polonium**

In chapter 5, we look at the Manhattan Project plutonium-injection experiments and related experimentation. Sick patients were used in sometimes secret experimentation to develop data needed to protect the health and safety of nuclear weapons workers. The experiments raise questions of the use of sick patients for purposes that are not of benefit to them, the role of national security in permitting conduct that might not otherwise be justified, and the use of secrecy for the purpose of protecting the government from embarrassment and potential liability.

### **Chapter 6. The AEC Program of Radioisotope Distribution**

In contrast to the plutonium injections, the vast majority of human radiation experiments were not conducted in secret. Indeed, the use of radioisotopes in biomedical research was publicly and actively promoted by the Atomic Energy Commission. Among the several thousand experiments about which little information is currently available, most fall into this category. The Committee adopted a two-pronged strategy to study this phenomenon. In chapter 6, we describe the system the AEC developed for the distribution of isotopes to be used in human research. This system was the primary provider of the source material for human experimentation in the postwar period. In studying the operation of the radioisotope distribution system, and the related "human use" committees at local institutions, we sought to learn the ground rules that governed the conduct of the majority of human radiation experiments, most of which have received little or no public attention. Also

in this chapter we review how research with radioisotopes has contributed to advances in medicine.

### **Chapter 7. Nontherapeutic Research on Children**

The Committee then selected for particular consideration, in chapter 7, radioisotope research that used children as subjects. We determined to focus on children for several reasons. First, at low levels of radiation exposure, children are at greater risk of harm than adults. Second, children were the most appropriate group in which to pursue the Committee's mandate with respect to notification of former subjects for medical reasons. They are the group most likely to have been harmed by their participation in research, and they are more likely than other former subjects still to be alive. Third, when the Committee considered how best to study subject populations that were most likely to be exploited because of their relative dependency or powerlessness, children were the only subjects who could readily be identified in the meager documentation available. By contrast, characteristics such as gender, ethnicity, and social class were rarely noted in research reports of the day.

### **Chapter 8. Total-Body Irradiation: Problems When Research and Treatment are Intertwined**

Moving from case studies focused on the injection or ingestion of radioisotopes, chapter 8 shifts to experimentation in which sick patients were subjected to externally administered total-body irradiation (TBI). The Committee discovered that the highly publicized TBI experiments conducted at the University of Cincinnati were only the last of a series in which the government sought to use data from patients undergoing TBI treatment to gain information for nuclear weapons development and use.

This experimentation spanned the period from World War II to the early 1970s, during which the ethics of experimentation became increasingly subject to public debate and government regulation. In contrast with the experiments that flowed from the AEC's radioisotope program, the use of external radiation such as TBI did not in its earlier years involve a government requirement of prior review for risk. The TBI experimentation raises basic questions about the responsibility of the government when it seeks to gather research data in conjunction with medical interventions of debatable benefit to sick patients.

### **Chapter 9. Prisoners: A Captive Research Population**

In chapter 9 we examine experimentation on healthy subjects, specifically prisoners, for the purpose of learning the effects of external irradiation on the testes, such as might be experienced by astronauts in space. The prisoner experiments were studied because they received significant public attention and because a literally captive population was chosen to bear risks to which no other group of experimental subjects had been exposed or has been exposed since. This research took place during a period in which the once commonly accepted practice of nontherapeutic experimentation on prisoners was increasingly subject to public criticism and moral outrage.

### **Chapter 10. Atomic Veterans: Human Experimentation in Connection with Bomb Tests**

Chapter 10 also explores research involving healthy subjects: human experimentation conducted in connection with atomic bomb tests. More than 200,000 service personnel--now known as atomic veterans--participated at atomic bomb test sites,

mostly for training and test-management purposes. A small number also were used as subjects of experimentation. The Committee heard from many atomic veterans and their family members who were concerned about both the long-term health effects of these exposures and the government's conduct. In seeking to reconstruct the story of human experimentation in connection with bomb tests, we found need and opportunity to examine the meaning of human experimentation in an occupational setting where risk is the norm.

### **Chapter 11. Intentional Releases: Lifting the Veil of Secrecy**

In chapter 11 we address the thirteen intentional releases of radiation into the environment specified in the Committee's charter, as well as additional releases identified during the life of the Committee. In contrast with biomedical experimentation, individuals and communities were not typically the subject of study in these intentional releases. The secret releases were to test intelligence equipment, the potential of radiological warfare, and the mechanism of the atomic bomb. While the risk posed by intentional releases was relatively small, the releases often took place in secret and remained secret for years.

### **Chapter 12. Observational Data Gathering**

The final case study, in chapter 12, looks at two groups that were put at risk by nuclear weapons development and testing programs and as a consequence became the subjects of observational research: workers who mined uranium for the Atomic Energy Commission in the western United States from the 1940s to 1960s and residents of the Marshall Islands, whose Pacific homeland was irradiated as a consequence of a hydrogen bomb test in 1954. While these observational studies do not fit the

classic definition of an experiment, in which the investigator controls the variable under study (in this case radiation exposure), they are instances of research involving human subjects. The Committee elected to examine the experiences of the uranium miners and the Marshallese because they raise important issues in the ethics of human research not illustrated in the previous case studies and because numerous public witnesses impressed on the Committee the significance of the lessons to be learned from their histories.

### **Chapter 13. Secrecy, Human Radiation Experiments, and Intentional Releases**

Part II concludes with an exploration of an important theme common to many of the case studies--openness and secrecy in the government's conduct concerning human radiation research and intentional releases. In chapter 13 we step back and look at what rules governed what the public was told about the topics under the Committee's purview, whether these rules were publicly known, and whether they were followed.

## **Part III. Contemporary Projects**

### **Chapter 14. Current Federal Policies Governing Human Subjects Research**

Chapter 14 reviews the current regulatory structure for human subjects research conducted or supported by federal departments and agencies, a structure that has been in place since 1991. This "Common Rule" has its roots in the human subject protection regulations promulgated by DHEW in 1974. The historical developments behind these regulations are described in chapter 3. Following a summary of the essential features of

the Common Rule, chapter 14 discusses several subjects of particular relevance to the Advisory Committee's work, such as special review processes for ionizing radiation research, protection for human subjects in classified research, and audit procedures of institutions performing human subjects research.

### **Chapter 15. Research Proposal Review Project**

Chapter 15 describes the Research Proposal Review Project (RPRP), the Advisory Committee's examination of documents from research projects conducted at institutions throughout the country, including both radiation and nonradiation proposals. Documents utilized in the RPRP were those available to the local institutional review boards (IRBs) at the institutions where the research was conducted. The goals of the RPRP were to gain an understanding of the ethics of radiation research as compared with nonradiation research; how well research proposals address central ethical considerations such as risk, voluntariness, and subject selection; and whether informed consent procedures seem to be appropriate.

### **Chapter 16. Subject Interview Study**

The RPRP discussed in chapter 15 reviewed documents prepared by investigators and institutions and submitted in IRB applications. This study was complemented by a nationwide effort to learn about research from the perspective of patients themselves, including those who were and were not research subjects. The Subject Interview Study (SIS), described in chapter 16, was conducted through interviews with nearly 1,900 patients throughout the country. The SIS aimed to learn the perspectives of former, current, and prospective research subjects by asking about their attitudes and beliefs regarding the

endeavor of human subject research generally and their participation specifically.

### **Discussion of Part III**

The RPRP tried to understand the experience of human subjects research from the standpoint of the local oversight process, while the SIS tried to understand it from the standpoint of the participant. Although the two studies related to different research projects and different groups of patients and subjects, some common tensions in the human research experience emerge in both projects, and they are described in the "Discussion" section of part III. For example, it has long been recognized that the physician who engages in research with patient-subjects assumes two roles that could conflict: that of the caregiver and that of the researcher. The goals inherent in each role are different: direct benefit of the individual patient in the first case and the acquisition of general medical knowledge in the second case. The interviews with SIS participants suggest that at least some patient-subjects are not aware of this distinction or of the potential for conflict. In our review of documents in the RPRP we found that the written information provided to potential patient-subjects sometimes obscured, rather than highlighted, the differences between research and medical care and thus likely contributed to the potential for patients to confuse the two.

## **Part IV. Coming to Terms with the Past, Looking Ahead to the Future: Findings and Recommendations**

### **Chapter 17. Findings**

In chapter 17, our findings are presented in two parts, first for the period 1944 through 1974 and then for the contemporary period. These parts, in turn, are divided into findings regarding biomedical experiments and those regarding population exposures.

We begin our presentation of findings for the period 1944 through 1974 with a summation of what we have learned about human radiation experiments: their number and purpose, the likelihood that they produced harm, and how human radiation experimentation contributed to advances in medicine. We then summarize what we have found concerning the nature of federal rules and policies governing research involving human subjects during this period, and the implementation of these rules in the conduct of human radiation experiments. Findings about the nature and implementation of federal rules cover issues of consent, risk, the selection of subjects, and the role of national security considerations.

Our findings about government rules are followed by a finding on the norms and practices of physicians and other biomedical scientists for the use of human subjects. We then turn to the Committee's finding on the evaluation of past experiments, in which we summarize the moral framework adopted by the Committee for this purpose. Next, we present our findings for experiments conducted in conjunction with atmospheric atomic testing, intentional releases, and other

population exposures. The remaining findings for the historical period address issues of government secrecy and record keeping.

Our findings for the contemporary period summarize what we have learned about the rules and practices that currently govern the conduct of radiation research involving human subjects, as well as human research generally, and about the status of government regulations regarding intentional releases.

## **Chapter 18. Recommendations**

Chapter 18 presents the Committee's recommendations to the Human Radiation Interagency Working Group and to the American people. The Committee's inquiry focused on research conducted by the government to serve the public good--the promotion and protection of national security and the advancement of science and medicine. The pursuit of these ends--today, as well as yesterday--inevitably means that some individuals are put at risk for the benefit of the greater good. The past shows us that research can bear fruits of incalculable value. Unfortunately, however, the government's conduct with respect to some research performed in the past has left a legacy of distrust. Actions must be taken to ensure that, in the future, the ends of national security and the advancement of medicine will proceed only through means that safeguard the dignity, health, and safety of the individuals and groups who may be put at risk in the process.

Many of our recommendations are directed not to the past but toward the future. The Committee calls for changes in the current federal system for the protection of the rights and interests of human subjects. These include changes in institutional review boards; in the interpretation of ethics rules and

policies; in the conduct of research involving military personnel as subjects; in oversight, accountability, and sanctions for ethics violations; and in compensation for research injuries. Unlike the 1944-1974 period, in which the Committee focused primarily on research that offered subjects no prospect of medical benefit, our recommendations for the future emphasize protections for patients who are subjects of therapeutic research, as many of the contemporary issues involving research with human subjects occur in this setting. We also call for the adoption of special protections for the conduct of human research or environmental releases in secret, protections that are not currently in place.

We realize, however, that regulations and policies are no guarantee of ethical conduct. If the events of the past are not to be repeated, it is essential that the research community come to increasingly value the ethics of research involving human subjects as central to the scientific enterprise. We harbor no illusions about the Pollyanna-ish quality of a recommendation for professional education in research ethics; we call for much more. We ask that the biomedical research community, together with the government, cause a transformation in commitment to the ethics of human research. We recognize and celebrate the progress that has occurred in the past fifty years. We recognize and honor the commitment to research ethics that currently exists among many biomedical scientists and many institutional review boards. But more needs to be done. The scientists of the future must have a clear understanding of their duties to human subjects and a clear expectation that the leaders of their fields value good ethics as much as they do good science. At stake is not only the well-being of future subjects, but also, at least in part, the future of biomedical science. To the extent that that future depends on public support, it requires the public's trust.

There can be no better guarantor of that trust than the ethics of the research community.

Finally, our examination of the history of the past half century has helped us understand that the revision of regulations that govern human research, the creation of new oversight mechanisms, and even a scrupulous professional ethics are necessary, but are not sufficient, means to needed reform. Of at least equal import is the development of a more common understanding *among the public* of research involving human subjects, its purposes, and its limitations. Furthermore, if the conduct of the government and of the professional community is to be improved, that conduct must be available for scrutiny by the American people so that they can make more informed decisions about the protection and promotion of their own health and that of the members of their family. It is toward that end that we close our report with recommendations for continued openness in government and in biomedical research. It is also toward that end that this report is dedicated. Some of what is regrettable about the past happened, at least in part, because we as citizens let it happen. Let the lessons of history remind us all that the best safeguard for the future is an informed and active citizenry.

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**ADVISORY COMMITTEE  
ON HUMAN RADIATION  
EXPERIMENTS**

Final Report

**October 1995**

## 10

## ATOMIC VETERANS: HUMAN EXPERIMENTATION IN CONNECTION WITH ATOMIC BOMB TESTS

In 1946, the United States conducted Operation Crossroads, the first peacetime nuclear weapons tests, before an audience of worldwide press and visiting dignitaries at the Bikini Atoll in the Pacific Marshall Islands. In 1949 the Soviet Union exploded its first atomic bomb, and in December 1950, shortly after the United States entered the Korean War, President Truman chose Nevada as the site for "continental testing" of nuclear weapons. Testing of atomic bombs in Nevada began in January 1951 and continued throughout the decade. Further testing of atomic, then hydrogen, bombs took place in the Pacific. By the time atmospheric testing was halted by the 1963 test ban treaty, the United States had conducted more than 200 atmospheric tests and dozens of underground tests.<sup>1</sup>

The rules governing nuclear weapons tests were not spelled out by law or handed down by tradition. They had to be created in ongoing interplay between the new Atomic Energy Commission and the new Department of Defense.

The tests were important to many governmental agencies but, of course, critical to the AEC and the DOD. The AEC, as the source of weapons design expertise, was interested in the performance of new bomb designs and, along with DOD, in the effects of the weapons. The DOD, and each of the armed services, had particular interests in the use of the tests to learn how atomic wars could be fought and won, if, as seemed quite possible at midcentury, they had to be. Along with "civilian agencies," such as the Public Health Service, the Veterans Administration, and the Department of Agriculture, they shared an interest in civil

defense against the use of the bomb in wartime and the impact of the bomb's use--in peacetime tests as well as war--on the public health and welfare. The bomb tests inevitably involved risk and uncertainty; safety was a basic and continued concern, and the development of radiation safety practices and understanding was therefore an essential part of the test program.

At its core, the test program was established to determine how well newly designed nuclear weapons worked; but officials and researchers quickly saw the need and opportunity to use the tests for other purposes as well. More than 200,000 people, including soldiers, sailors, air crews, and civilian test personnel, were engaged to staff the tests, to participate as trainees or observers, and to gather data on the effects of the weapons.

The Committee was not chartered to review the atomic bomb tests or the experience of the troops present at the detonations. However, early in our tenure we heard from veterans who participated in the tests, and their family members, who urged that we include their experiences in our review. In testimony before the Advisory Committee, "atomic vets" and their widows stated forcefully that all those who participated in the bomb tests were in a real sense participants in an experiment. It also was argued that biomedical experiments involving military personnel as human subjects took place in connection with the tests. The interest among atomic veterans and their families in the activities of the Advisory Committee and the government's commitment to investigating human radiation experiments was intense. When the Department of Energy established its Helpline for citizens concerned about human radiation experiments, for example, bomb-test participants and their family members were the single largest group of callers among the approximately 20,000 calls received.

That the bomb tests were in some sense experiments is, of course, correct. The tests of new and untried atomic weapons were, wrote the chief health officer of the AEC's Los Alamos lab, "fundamentally large scale laboratory experiments."<sup>2</sup> At the same time, although there was a real possibility that human subject research had been conducted in conjunction with the bomb tests, the tests were not themselves experiments involving human subjects.

The Committee reviewed the historical record to determine if human experiments had taken place in connection with the tests. We found that somewhere in the range of 2,000 to 3,000 military personnel at the tests did serve as the subjects of research in connection with the tests. In most cases, these research subjects were engaged in activities similar to those engaged in by many other service personnel who were not research subjects. For example, some air crew flew through atomic clouds in experiments to measure radiation absorbed by their bodies, but many others flew in or around atomic clouds to gather data on radiation in the clouds. The Defense Department generally did not distinguish such research from otherwise similar activities, treating both as part of the duties of military personnel. The experience of the atomic veterans illustrates well the difficulty in locating the boundary between research involving human subjects

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and other activities conducted in occupational settings that routinely involve exposure to hazards.

The more the Committee investigated the human research projects conducted in conjunction with the bomb tests, the more we found ourselves discussing issues that affected all the service personnel who had been present at the tests, and not just those who also had been involved as subjects of research. This occurred both because of the boundary problem just described and because critical decisions about initial exposure levels and follow-up of veterans were generally not made separately for research subjects and other personnel present at the tests. Legislation passed in 1984 and 1988 that provides the basis for compensation to some atomic veterans similarly does not distinguish between those veterans who were research subjects and the vast majority who were not.

In this chapter we present what we have learned about human experimentation conducted in conjunction with atomic bomb testing as well as some observations about the experience of the atomic veterans generally. In the first section of the chapter we focus on research involving human subjects. We begin by a review of the 1951-1952 discussions in which DOD biomedical advisers considered the role of troops at the bomb tests and the need for biomedical research to be conducted in conjunction with them. We then look at a research activity that was given the highest priority by these advisers, the psychological and physiological testing of troops involved in training maneuvers at bomb tests and of officers who volunteered to occupy foxholes in the range of one mile from ground zero. We next turn to the so-called flashblindness experiments conducted to measure the effect on vision of the detonation of an atomic bomb. Finally, we look at research in which men were used to help measure the radiation absorbed by protective clothing, by equipment that humans operated, and by the human body. We note at the outset that while the studies all took place in the context of the atomic bomb, and therefore involved some potential exposure to radiation, none of them were designed to measure the biological effects of radiation itself (as opposed to the levels of exposure). A basic reason this was so was the determination of the DOD and the AEC to keep exposure levels of test participants below those at which acute radiation effects were likely to be experienced (and therefore measurable).

In the second section of the chapter we discuss issues of concern to the Committee that affected all the atomic veterans. We review how risk was considered by AEC and DOD officials at the time the tests were being planned, the creation and maintenance of records related to bomb-test exposure, and what is now known about the longer-term risks of participation in the tests. We also discuss the legacy of distrust among atomic veterans and their families that stems, in part, from the failure to create and maintain adequate records. Finally, we conclude with a discussion of what the atomic bomb-test experience tells us about the boundary between experimental and occupational exposures to risk and some lessons that remain to be learned from the experience of the atomic veterans.

## HUMAN RESEARCH AT THE BOMB TESTS

### **The Defense Department's Medical Experts: Advocates of Troop Maneuvers and Human Experimentation**

As we saw in the introduction, in 1949, when AEC and DOD experts met to consider the psychological problems connected to construction of the proposed nuclear-powered airplane, the NEPA project, there was a consensus that America's atomic war-fighting capability would be crippled unless servicemen were cured of the "mystical" fear of radiation.<sup>3</sup> When routine testing of nuclear weapons began at the test site in Nevada in 1951, the opportunity to take action to deal with this problem presented itself. DOD officials urged that troop maneuvers and training exercises be conducted in connection with the tests. Whole military units would be employed in these exercises, and participation, as part of the duty of the soldier, would not be voluntary. DOD's medical experts simultaneously urged that the tests be used for training and "indoctrination" about atomic warfare and as an opportunity for research. The psychological and physiological testing of troops to address the fear of radiation was the first of the research to take place; this testing was largely conducted as an occupational rather than an experimental activity.

In a June 27, 1951, memorandum to high DOD officials, Dr. Richard Meiling, the chair of the secretary of defense's top medical advisory group, the Armed Forces Medical Policy Council, addressed the question of "Military Medical Problems" associated with bomb tests.<sup>4</sup> The memorandum made clear that troops should be placed at bomb tests not so much to examine risk as to demonstrate relative safety.

"Fear of radiation," Dr. Meiling's memorandum began, "is almost universal among the uninitiated and unless it is overcome in the military forces it could present a most serious problem if atomic weapons are used." In fact, "[i]t has been proven repeatedly that persistent ionizing radiation following air bursts does not occur, hence the fear that it presents a dangerous hazard to personnel is groundless." Dr. Meiling urged that "positive action be taken at the earliest opportunity to demonstrate this fact in a practical manner."<sup>5</sup>

He continued, a "Regimental Combat Team should be deployed approximately twelve miles from the designated ground zero of an air blast and immediately following the explosion . . . they should move into the burst area in fulfillment of a tactical problem." The exercise "would clearly demonstrate that persistent ionizing radiation following an air burst atomic explosion presents no hazards to personnel and would effectively dispel a fear that is dangerous and demoralizing but entirely groundless."<sup>6</sup>

Dr. Meiling's proposal to put troops at the bomb tests in order to allay their fears may well have been an echo of what the military already had in mind. The Army's 1950 "Atomic Energy Indoctrination" pamphlet, a primer for soldiers,

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showed that the military was concerned that misperception of the effect of an air burst could be damaging in combat. "[L]ingering radioactivity will be virtually nonexistent in the case of the normal air burst,"<sup>7</sup> it reassured the soldiers. The greater danger, it told them, was the probability that "an unreasoning fear of lingering radioactivity" would take "an unnecessary toll in American lives."<sup>8</sup>

While the tests provided an opportunity to allay fears, they simultaneously provided the opportunity to gather data. In this regard, Dr. Meiling appeared to be ahead of his military colleagues in expressing concern that the military was not taking adequate advantage of the bomb tests as an opportunity for "biomedical participation." In February 1951, in fact, following tests in Nevada, he had urged the DOD to incorporate "biomedical tests" into plans for future bomb tests.<sup>9</sup>

Meiling's suggestion that planning for biomedical tests be undertaken wound its way through the secretary of defense's research and development bureaucracy and fell into the lap of the civilian-chaired Joint Panel on the Medical Aspects of Atomic Warfare.<sup>10</sup> Under the chairmanship of Harvard's Dr. Joseph Aub, the Joint Panel was the gathering place for the small world of government radiation researchers and their private consultants. Its periodic "Program Guidance Reports" laid out the atomic warfare medical research agenda, summarizing work that was ongoing and that which remained. At its meetings, participants heard from the CIA on foreign medical intelligence, debated the need for human experimentation, and learned of the latest developments in radiation injury research, of the blast and heat effects of the bomb, and of instruments needed to measure radiation effects.

In September 1951 the Joint Panel considered a draft report on "biomedical participation" in bomb tests.<sup>11</sup> "It is, of course obvious," the report noted, "that a test of a new and untried atomic weapon is not a place to have an unlimited number of people milling about and operating independently." Planning was therefore in order. There were, the document explained, basic criteria for "experimentation" at bomb tests. For example, "Does the experiment have to be done at a bomb detonation; is it impossible or impractical in a laboratory?"<sup>12</sup>

The document turned to "specific problems for future tests." The list of twenty-nine problems was not intended to be all-inclusive, but was "designed to show the types of problems which should be considered as a legitimate basis for biomedical participation in future weapons tests." The term *human experimentation* was not used, and most of the items could be performed without humans.<sup>13</sup> However, the list included several examples of research involving human subjects:

11. Effects of exposure of the eye to the atomic flash . . .

24. Measurements of radioactive isotopes in the body fluids of atomic weapons test personnel . . .

- 27. The efficiency and suitability of various protective devices and equipment for atomic weapons war . . .
- 28. Psychophysiological changes after exposure to nuclear explosions.
- 29. Orientation flights in the vicinity of nuclear explosions for certain combat air crews.<sup>14</sup>

By the end of the decade, human research would be conducted in all these areas.<sup>15</sup>

At the same September meeting, the Joint Panel also considered a "Program Guidance Report" on the kinds of atomic warfare-related research that needed to be conducted, in the laboratory as well as in the field. The areas singled out for immediate and critical attention included the initiation of "troop indoctrination at atomic detonations" and "psychological observations on troops at atom bomb tests."<sup>16</sup>

A section on "Biomedical Participation in Future Atomic Weapons Tests" concluded that the next step should be

- 4.1 To complete present program and plan for participation in future tests in light of results from Operation GREENHOUSE [a prior atomic test series]. *These plans should include studies on the effect of atomic weapons detonations on a troop unit in normal tactical support [emphasis added].*<sup>17</sup>

Thus, while it was well known at the time that troops participated at the bomb tests and were subjected to psychological testing, it now is evident that the DOD's medical advisers advocated the presence of the troops at the tests for both training and research purposes. The doctors were not alone in attaching high priority to such research. The Joint Panel's September guidance punctuated, perhaps echoed, the Armed Forces Special Weapons Projects's midsummer 1951 call for a "systematic research study . . . [to] provide a sound basis for estimating troop reaction to the bomb experience and . . . the indoctrination value of the maneuver."<sup>18</sup>

### **The HumRRO Experiments**

Just two months later, in November 1951, at a bomb test in the Nevada desert, the Army conducted the first in a series of "atomic exercises."<sup>19</sup> This exercise was designed primarily to train and indoctrinate troops in the fighting of

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atomic wars. The exercise also provided an opportunity for psychological and physiological testing of the effects of the experience on the troops.

Desert Rock was an Army encampment in Nevada adjacent to the nuclear test site. At the exercise named Desert Rock I, more than 600 of the 5,000 men present would be studied by psychologists from a newly created Army contractor, the Human Resources Research Organization (HumRRO). HumRRO's research was directed by Dr. Meredith Crawford, who was recruited by the Army from a deanship at Vanderbilt University.<sup>20</sup> The identity of all the participants involved in the "HumRRO experiments," and the further DOD research discussed later in this chapter, is not known. The numbers of those who participated must be reconstructed from available reports.<sup>21</sup>

The highly publicized bomb test was well attended by military and civilian officials. "Las Vegas, Nevada," *Time* magazine reported, "had not seen so many soldiers since World War II. . . . The hotels were jammed with high brass. . . . [o]ut on the desert, 65 miles away 5,000 hand-picked troops were getting their final briefing before Exercise Desert Rock I--the G.I.'s introduction to atomic warfare."<sup>22</sup> The detonation, Representative Albert Gore (father of the current Vice President), told the *New York Times*, was "the most spectacular event I have ever witnessed. . . . As I witnessed the accuracy and cataclysmic effect of the explosion, I felt the conviction that it might be used in Korea if the cease-fire negotiations broke down."<sup>23</sup>

To render the experience more realistic, the observers and participants were told to imagine that aggressor armies had invaded the United States and were now at the California-Nevada border. An atomic bomb would be dropped, with the troops occupying a position seven miles from ground zero. After the detonations they would "attack into the bombed area."<sup>24</sup>

At their home base, two groups of troops--a control group that would stay at home base and an experimental group that would go to Nevada--had listened to lectures and seen films intended to "indoctrinate" them about the effects of the bomb and radiation safety. Both groups were administered a questionnaire to determine how well they had understood the information provided. Dr. Crawford explained in a 1994 interview that "indoctrination," which today has a negative connotation, was not intended to suggest misrepresentation of fact, but "had more to do with attitude, feeling and motivation."<sup>25</sup> At Desert Rock, the experimental group was given a further "non-technical briefing." They were "reminded that no danger of immediate radiation remains 90 seconds after an air burst; that they would be sufficiently far from ground zero to be perfectly safe without shelter; and that with simple protection they could even be placed quite close to the center of the detonation, with no harm to them."<sup>26</sup>

After the blast, a questionnaire was again administered to most of the experimental subjects, and physiological measurements including blood pressure and heart rates were taken. The questionnaire was designed to test the success of the "indoctrination."<sup>27</sup> For example, questions included (answers in parentheses

were those the HumRRO report stated were correct):

1. Suppose the A-bomb were used against enemy troops by exploding it 2000 feet from the ground and suppose all enemy troops were killed. How dangerous do you think it would be for our troops to enter the area directly below the explosion within a day? (Not dangerous at all). . . .

6. If an A-bomb were exploded at 2000 feet, under what conditions would it be safe to move into the spot directly below, right after the explosion? (Safe if you wore regular field clothing.)<sup>28</sup>

These answers were not correct. Answers to questions like the above depend on weather conditions, the yield of the weapon, and the assumptions about the degree of risk from low levels of exposure. For example, while an airburst (where the fireball does not touch the ground) may result in little fallout in the immediate area of the blast, it does not result in none; if rain is present, a substantial amount of fallout may be localized.

Similarly, whereas the 1946 Bikini bomb tests at Operation Crossroads in the Pacific had caused contamination so severe that many of the surviving ships were scrapped, the question and answer provided said:

Some of the ships in the Bikini tests had to be sunk because they were too radioactive to be used again. (False).<sup>29</sup>

In a 1995 review of the 1951 questionnaire, the Defense Department found that "changes/corrections/clarifications" would be in order for nine of the thirty questions.<sup>30</sup>

In January 1952, the Army surgeon general expressed "continuing interest in the conduct of psychiatric observations," offering funds for "Psychiatric Research in Connection with Atomic Weapons Tests Involving Troop Participation."<sup>31</sup> In March 1952, however, the Army and the Armed Forces Special Weapons Project (AFSWP), which coordinated nuclear weapons activities for the DOD, provided critical reflections on Desert Rock I. "[O]ne is inevitably drawn to the conclusion," the Army reported, "that the results, though measurable, were highly indeterminate and unconvincing. The limitations of evaluation were inherent in the problem. Handicapped by a preconceived notion that there would be no reaction, it took on the form of a gigantic experiment whose results were already known. No well controlled studies could be undertaken which could presume even superficial validity. . . ."<sup>32</sup> In a letter to the AEC, the AFSWP went

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further. Owing to the "tactically unrealistic distance of seven miles to which all participating troops were required to withdraw for the detonation,"<sup>33</sup> troops might get the wrong impression about nuclear warfare.

In 1994, Dr. Crawford reflected on the logic of testing for panic in an environment that was thought to be too safe. "No troops," Dr. Crawford recalled, "were exposed anywhere where anybody thought there was any danger, so you might ask the question, so what? I've asked that question myself and I've thought about it. It was the first HumRRO project. It was really pretty well agreed upon before I got up here from Tennessee . . . so we did what we could."<sup>34</sup>

Despite the reservations about the 1951 study, on May 25, 1952, the Army conducted its second HumRRO experiment at the exercise called Desert Rock IV. It was similar in methodology to the first experiment and involved about 700 soldiers who witnessed the shot and 900 who served in the control group as nonparticipants.<sup>35</sup> This time, to add more realism, the troops witnessed the blast, an 11-kiloton weapon that was set off from the top of a tower, from four miles from ground zero. By the end of the second research effort, there was even more reason to question the utility of the experiments. HumRRO's report on Desert Rock IV stated that while knowledge increased as a result of the indoctrination, the actual maneuver experience did not produce significant improvement in test scores and decreases were actually reported on some questions.<sup>36</sup>

In both Desert Rock I and Desert Rock IV, the Army hoped that the troops who witnessed the blasts would disseminate information to the troops who stayed at home base. However, the troops who participated in the exercises were warned that discussion of their experiences could bring severe punishment, and the researchers found that communication was at a minimum.<sup>37</sup> Moreover, those who stayed home, HumRRO found, "showed no evidence of great interest, of extensive discussion, or of any important benefit from dissemination as a result of the atomic maneuver."<sup>38</sup> Meanwhile, the experience that the participants had been warned not to discuss and that was of little interest to their comrades was front-page news throughout the country. "When they returned to camp," *Time* reported of the first Desert Rock exercise, "the men were quickly herded into showers. Some were given test forms to fill out. Did you sweat? Did your heart beat fast at any time? Did you lose bladder control? Most of the answers were no."<sup>39</sup>

Without any direct comment on the results of the Desert Rock I and IV experiments, in September 1952, the Joint Panel urged that the psychological research continue:

It is possible that inclination to panic in the face of AW [atomic warfare] and RW [radiological warfare] may prove high. It seems advisable, therefore, to increase research efforts in the scientific study of panic and its results, and to seek means for prophylaxis. . . . The panel supports the

point of view that troop participation in tests of atomic weapons is valuable. As many men as possible ought to be exposed to this experience under safe conditions. Psychological evaluation is difficult and results can be expected to appear superficially trivial, but the matter is of such extreme importance that the research should be persisted in, utilizing every opportunity.<sup>40</sup>

Indeed, a third set of experiments was carried out in April 1953, at Desert Rock V; this time, the number of participants is unknown.<sup>41</sup>

The final HumRRO bomb test study was conducted in 1957 at Operation Plumbbob.<sup>42</sup> No formal report was prepared, but the experience was recorded in a personalized recollection by a HumRRO staffer.<sup>43</sup> Weather-related delays, the departure of HumRRO staff, the continued redesign of the exercises, and the failure of a fifth of the troops to return from a weekend pass in time for the events took their toll. The researchers were not given the script used in the indoctrination lectures to the troops. Thus, it was impossible for the researchers to know whether incorrect responses were due to "lack of inclusion of the topic in the orientation or to ineffective instruction."<sup>44</sup> The research was to include exercises such as crawling over contaminated ground.<sup>45</sup> But, yet again, the researchers found that the safety rules in force precluded important study: "shock . . . and panic . . . would not be observed."<sup>46</sup>

There is no question that HumRRO activities were research involving human subjects; the projects involved an experimental design in which soldier-subjects were assigned either to an experimental or a control condition. Available evidence suggests, however, that the Army did not treat HumRRO as a discretionary research activity but as an element of the training exercise in which soldiers were participating in the course of normal duty. The HumRRO subjects were apparently not volunteers. Dr. Crawford in 1994 said of the HumRRO subjects, "Whether they were requested to formally give their consent is pretty unknowable because in the Army or any other military service people generally do what they're asked to do, told to do."<sup>47</sup> Indeed, as HumRRO's initial report stated, the primary purpose of the atomic exercise was training; "research was necessarily of secondary importance."<sup>48</sup> However, Dr. Crawford felt confident that the risks were disclosed. Because of the "number and intensity of briefings . . . [n]o soldier, to our knowledge, went into the test situation with no idea about what to expect. They were adequately informed."<sup>49</sup>

We now know that in 1952 the Defense Department's medical experts were simultaneously locked in discussion of the need for psychological studies and other human research at bomb tests and, as we saw in chapter 1, the need for a policy to govern human experimentation related to atomic, biological, and chemical warfare. In October of that year, the Armed Forces Medical Policy

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Council recommended that the Nuremberg Code be adopted, as it was by Secretary Charles Wilson in 1953. What is still missing is information that might show how, as seems to be the case, the same experts could have been having these discussions without communicating the essence of them to those responsible for conducting the human research at the tests. There is no evidence that the investigators responsible for HumRRO were informed about the Wilson memo. Dr. Crawford, for example, when queried in 1994, reported that he did not know of the 1953 Wilson memorandum. It is possible that HumRRO was not viewed as being subject to the requirements stated in the Wilson memo despite the fact that it was human research relating to atomic warfare. Although the experimental variable was participation at a bomb test, arguably, the troops would have been present at the test in any event, along with many thousands of other soldiers who were not subjects in the HumRRO research.

**Atomic Effects Experiments**

At the same time that the third set of HumRRO experiments was being conducted, in April 1953 at Desert Rock V, the Army called on several dozen "volunteers for Atomic Effects Experiments."<sup>50</sup> According to the Army, all were officers familiar with the "experimental explosion involved" and were able to personally judge "the probability of significant variations in [weapon] yield." They were instructed to choose the distance from ground zero they would like to occupy in a foxhole at the time of detonation, as long as it was no closer than 1,500 yards. If the surviving documentation is the measure, these officers, and perhaps officer volunteers in the subsequent Desert Rock series, were the only subjects of bomb-test research who signed forms saying that they were voluntarily undertaking risk.<sup>51</sup> The exposures were meant to set a standard for developing "troop exposure programs and for confirming safety doctrine for tactical use of atomic weapons."<sup>52</sup>

An Army report on the volunteers at Desert Rock V concluded that there would be "little more to be gained by placing volunteer groups in forward positions on future shots."<sup>53</sup> An April 24, 1953, Army memorandum recommended termination of the program "as little will be gained in repeatedly placing volunteers in trenches 2000 yards from ground zero."<sup>54</sup> However, officer volunteers were called on again at the next Desert Rock exercises at the 1955 nuclear test series called Operation Teapot. Following Teapot, the Army recommended that further experiments be conducted in which the volunteers would be moved closer to ground zero, "until thresholds of intolerability are ascertained."<sup>55</sup> This "use of human volunteers under conditions of calculated risk," the Army told the AFSWP, "is essential in the final phase of both the physiological and psychological aspects of the overall program."<sup>56</sup>

In response, the AFSWP pointed out that the injury threshold could not be determined "without eventually exceeding it."<sup>57</sup> The Army was essentially

proposing human beings be exposed to the detonation's blast effects to the point of injury. The proposal, an AFSWP memo explained, would not pass muster under the rules of the Nevada Test Site and was otherwise unacceptable:

In particular, it is significant that the long range effect on the human system of sub-lethal doses of nuclear radiation is an unknown field. Exposure of volunteers to doses higher than those now thought safe may not produce immediate deleterious effects; but may result in numerous complaints from relatives, claims against the Government, and unfavorable public opinion, in the event that deaths and incapacitation occur with the passage of time.<sup>58</sup>

If the Army wanted more data on blast effects, AFSWP declared, it should proceed with laboratory experiments, for which money would be made available. The AFSWP was not opposed to the kinds of activities that had previously taken place at Desert Rock. But those activities, AFSWP's memo observed in passing, "cannot be expected to produce data of scientific value."<sup>59</sup>

The Desert Rock experience was apparently repeated, again with officer volunteers, in the next Nevada test series, the 1957 Operation Plumbbob. Although the total number of officers involved in all of the "officer volunteer" experiments is not known, it is probably fewer than one hundred.

### **The Flashblindness Experiments**

Beginning with the 1946 Bikini tests, experiments with living things became a staple of bomb tests. At Operation Crossroads, animals were penned on the decks of target ships to study the effects of radiation. In the 1948 Sandstone series at the Marshall Islands Enewetak Atoll, seeds, grains, and fungi were added. In 1949, the AEC and the DOD began to coordinate the planning of the biomedical experiments at tests and set up a Biomedical Test Planning and Screening Committee to review proposals.<sup>60</sup> Presumably, the human experiments at bomb tests should have been filtered through this or some other review process designated to consider experiments. Yet, in only one case--flashblindness experiments--did this happen.

With Dr. Meiling's 1951 call for renewed DOD effort at biomedical experimentation came a revival of the DOD-AEC joint biomedical planning. From the start, the AEC doubted DOD's willingness to cooperate.<sup>61</sup> In a January 1952 letter to Shields Warren, Los Alamos's Thomas Shipman complained that the committee was limited to reviewing proposals from civilian groups, and not the military: "[I]f," he wrote, the "AEC can not exercise a measure of control in this matter, they might better withdraw from the picture completely and permit

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the military to continue on its own sweet way without the somewhat ludicrous spectacle of an impotent committee's snapping its heels like a puppy dog."<sup>62</sup> In retrospect, Shipman wrote to Warren's successor in June 1956, the military's refusal to participate "reduced that committee to impotence."<sup>63</sup>

Whatever its effectiveness, in 1952 the biomedical research screening group did consider at least one of the military's flashblindness experiments.<sup>64</sup> Flashblindness--the temporary loss of vision from exposure to the flash--was a serious problem for all the armed services, but particularly for the Air Force. Pilots flying hundreds of miles an hour in combat could not afford to lose concentration and vision even temporarily.<sup>65</sup>

The flashblindness experiments began at the 1951 Operation Buster-Jangle, the series that included Desert Rock I, with the testing of subjects who "orbit[ed] at an altitude of 15,000 feet in an Air Force C-54 approximately 9 miles from the atomic detonation. . . ."<sup>66</sup> The test subjects were exposed to three detonations during the operation, after which changes in their visual acuity were measured.<sup>67</sup> Although these experiments were conducted at bomb tests that potentially exposed the subjects to ionizing radiation, the purpose of the experiment was to measure the thermal effects of the visible light flash, not the effects of ionizing radiation.

When another experiment was proposed for Operation Tumbler-Snapper, the 1952 Nevada tests, the AEC sought a "release of AEC responsibility" on grounds that "there is a possibility that permanent eye damage may result."<sup>68</sup> It is not clear how the military responded, but the experiment proceeded. Twelve subjects witnessed the detonation from a darkened trailer about sixteen kilometers from the point of detonation.<sup>69</sup> Each of the human "observers" placed his face in a hood; half wore protective goggles, while the other half had both eyes exposed.<sup>70</sup> A fraction of a second before the explosion, a shutter opened, exposing the left eye to the flash.<sup>71</sup> Two subjects incurred retinal burns, at which point the project for that test series was terminated.<sup>72</sup> The final report recorded that both subjects had "completely recovered."<sup>73</sup>

At the 1953 tests, the Department of Defense engaged in further flashblindness study.<sup>74</sup> During this experiment, "twelve subjects [dark-adapted] in a light-tight trailer were exposed to five nuclear detonation flashes at distances of from 7 to 14 miles."<sup>75</sup>

The flashblindness experiments were the only human experiments conducted under the biomedical part of the bomb-test program and the only human experiments where immediate injury was recorded. They were also the only experiments where there is evidence of any connection to the 1953 Wilson memorandum applying the Nuremberg Code to human experimentation.

Recently recovered documents show that upon a 1954 review of a report showing the injuries at the 1952 experiment, AFSWP medical staff immediately declared that "a definite need exists for guidance in the use of human volunteers as experimental subjects."<sup>76</sup> Further inquiry revealed that a Top Secret policy on

the subject existed. That policy detailed "very definite and specific steps" that had to be taken before volunteers could be used in human experimentation. But, the AFSWP wrote, "No serious attempt has been made to disseminate the information to those experimenters who had a definite need-to-know."<sup>77</sup>

Nonetheless, some form of consent was obtained from at least some of the flashblindness subjects. In a 1994 interview, Colonel John Pickering, who in the 1950s was an Air Force researcher with the School of Aviation Medicine, recalled participating as a subject in one of the first tests where the bomb was observed from a trailer, and his written consent was required. "When the time came for ophthalmologists to describe what they thought could or could not happen, and we were asked to sign a consent form, just as you do now in the hospital for surgery, I signed one."<sup>78</sup> There is no documentation showing whether subsequent flashblindness experiments, which followed upon the issuance of the secretary of defense's 1953 memorandum, required informed and written consent. However, given the recollection of Colonel Pickering and the military tradition of providing for voluntary participation in biomedical experimentation, this may well have been the case. (A report on a flashblindness experiment at the 1957 Plumbbob test uses the term *volunteers*;<sup>79</sup> a report on 1962 "studies" at Dominic I provides no further information.)<sup>80</sup>

In early 1954 the Air Force's School of Aviation Medicine reported that animal studies and injuries at bomb tests (to nonexperimental participants) had shown that potential for eye damage was substantially worse than had been understood.<sup>81</sup> Studies of flashblindness with humans continued in both field and laboratory tests through the 1960s and into the 1970s. These experiments tested prototype versions of eye protection equipment, and the results were used to recommend requirements for eye protection for those exposed to atomic explosions.<sup>82</sup>

### **Research on Protective Clothing**

In late 1951, following the first Desert Rock exercise, the government conducted Operation Jangle, a nuclear test series that detonated two nuclear weapons, one on the surface and one buried seventeen feet underground. The two Jangle shots were tests where the weapon's fireball touched the ground. When a nuclear weapon's fireball touches the ground it creates much more local fallout than an explosion that bursts in the air. Consequently, these tests posed some potential hazard to civilians who lived near the test site and to test observers and participants.

Two weeks before Jangle the DOD requested an additional 500 observers at each of the Jangle shots, to acclimate the troops to nuclear weapons. The AEC advised against the additional participants, declaring that "[t]his [the first detonation] was an experiment which had never been performed before and the radiological hazards were unpredictable." In the AEC's view, no one should

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approach ground zero for three or four days after the surface shot.<sup>83</sup>

The AEC seems to have been successful in persuading the Department of Defense not to include the extra observers, but the DOD did not agree to the AEC's suggestion on approaching ground zero. Four hours after the first shot, the DOD conducted research involving troops who were accompanied by radiation safety monitors.<sup>84</sup> Eight teams of men walked over contaminated ground for one hour to determine the effectiveness of protective clothing against nuclear contamination.<sup>85</sup> Similar tests were conducted after the second shot at Jangle, but this time after a longer period. Five days after the shallow underground shot, men crawled over contaminated ground, again to determine the effectiveness of protective clothing.<sup>86</sup> Other men rode armored vehicles through contaminated areas to check the shielding effects of tanks and to check the effectiveness of air-filtering devices.<sup>87</sup> According to the final report, the protective clothing was "adequate to prevent contact between radioactive dust and the skin of the wearer."<sup>88</sup>

The information on this research is limited. The only mention of the subjects in the report reads, "The volunteer enlisted men, too numerous to mention by name, who participated in the evaluation of protective clothing were of great assistance which is gratefully acknowledged."<sup>89</sup> It is likely that at the time these men were not viewed as subjects of scientific research but rather as men who had volunteered for a hazardous or risky assignment. We know nothing about what these men were told about the risks or whether they felt they could have refused the assignment if they had an interest in doing so.

The Jangle activities are a good illustration of difficulties in drawing boundaries in the military between activities that are research involving human subjects and activities that are not. Although the Jangle evaluation was likely not considered an instance of human research at the time, it has many similarities to ground-crawling activity conducted several years later, not in conjunction with a nuclear test, that was treated as research involving human subjects. In 1958 ninety soldiers at Camp Stoneman, in Pittsburg, California, were asked to perform "typical army tactical maneuvers" on soil that had been contaminated with radioactive lanthanum.<sup>90</sup> The soldiers were then monitored for their exposure to study beta contamination from this nonpenetrating form of radiation. In 1963 soldiers were again asked to maneuver on ground contaminated with artificial fallout, this time at Camp McCoy in Wisconsin.<sup>91</sup>

The plans for the 1958 maneuvers, which were administered by the Navy's Radiological Defense Laboratory, had been submitted for secretarial approval, as was required for biomedical experiments involving Navy personnel.<sup>92</sup> In accordance with the Navy rules, the soldiers signed "written statements of voluntary participation."<sup>93</sup> During the 1963 experiments the Army processed the activity under its 1962 regulation on human experimentation (AR 70-25).<sup>94</sup> This rule, a public codification of the secretary of defense's 1953 Nuremberg Code rule, also required secretarial review and written consent.<sup>95</sup>

**Cloud-Penetration Experiments**

What are the dangers to be encountered by the personnel who fly through the cloud?--How much radiation can they stand?--How much heat can the aircraft take?--Can the ground crews immediately service the aircraft for another flight?--If so, what precautions are necessary to insure their safety?<sup>96</sup>

The Air Force felt that it was essential to answer these questions. To do so, it carried out experiments, including some with animals and a few with humans.

At the first atomic tests the military used remote-controlled aircraft, called "drones," to enter and gather samples from atomic clouds in order to estimate the yield and learn the characteristics of the weapon being tested. Military pilots did, however, "track" mushroom clouds, gathering information and plotting the cloud's path in order to warn civilian aircraft. During a 1948 test, a cloud tracker piloted by Colonel Paul Fackler inadvertently got too close to a cloud. But after the accident, Colonel Fackler commented, "No one keeled over dead and no one got sick."<sup>97</sup> Colonel Fackler's experience, an Air Force history later recorded, showed that manned flight through an atomic cloud "would not necessarily result in a lingering and horrible death."<sup>98</sup>

Some of the trackers had "sniffers" on their aircraft to collect small samples. The Air Force conducted experimental sampling missions at 1951 tests and later permanently replaced the drones with manned aircraft because drones were difficult to use, and they often did not get the quality samples of the atomic cloud that Atomic Energy Commission scientists desired. By Operation Teapot (1955), the AEC considered the testing of a nuclear device "largely useless" unless sampler aircraft were used to obtain fission debris that would be used to estimate the nuclear weapon's performance.<sup>99</sup>

As the sampling mission became routine, a new mission in the clouds began. At Teapot the Air Force performed the first manned "early cloud penetration." The phrase was used by the Air Force to refer to missions conducted as soon as minutes after detonation of the test weapon. The main purpose was to discover the radiation and turbulence levels within the cloud at early times after detonation.

Like the first sampling missions, the first early cloud-penetration missions were conducted by unmanned drone aircraft. In 1951 Colonel (now General) E. A. Pinson, an Air Force scientist who had earlier conducted tracer experiments on himself and other scientists, placed mice aboard a drone aircraft; in 1953 he flew mice, monkeys, and instrumentation in drone aircraft through atomic clouds. Pinson concluded that the radiation risk from flying manned aircraft through atomic clouds could be controlled by monitoring the external gamma dose.<sup>100</sup> But

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the Air Force was not convinced and asked Pinson to follow up the animal experiments with studies with humans during Operation Teapot (1955) and Operation Redwing (1956) to confirm the results. This research appears to have involved a small number of subjects, perhaps in the range of a dozen or so.

Pinson designed the human experiments to "learn exactly how much radiation penetrates into the human system"<sup>101</sup> when humans flew through a mushroom cloud. The Air Force had pilots swallow film contained in small watertight capsules. The film was attached to a string held in their mouths, so that it could be retrieved at the end of the mission.<sup>102</sup> When the film was retrieved, the researchers compared the exposures measured inside the human body with those measured on the outside. They found that the doses measured outside the body were essentially identical to the doses inside the body; this was a critical finding, because it meant that surface measurements would be "representative of the whole-body dose."<sup>103</sup>

For the experiment, the AEC test manager for Teapot waived the AEC's test-exposure limit of 3.9 roentgens and permitted four Air Force officers to receive up to 15 roentgens whole-body radiation.<sup>104</sup> The exemption was "based on the importance of [the project] to the Military Effects Test program and the fact that radiation up to 15 R may be necessary for its successful accomplishment."<sup>105</sup> When the air crews entered the atomic clouds, they measured dose rates of radiation as high as 1,800 rad per hour. Since the crews were in the cloud for such a short period of time, however, the actual doses were much lower than 1,800 R.<sup>106</sup> The maximum reported dose received on a single mission was 17 R,<sup>107</sup> higher than the 15 R authorized for the project. Since the air crews flew on several missions, two of the crew members received more than 17 R.<sup>108</sup>

A year later, at Operation Redwing, where the atomic and hydrogen bombs were tested, the Air Force conducted another series of experimental cloud penetrations. Part of the Redwing experiment was to measure the hazard from inhaling or ingesting radioactive particles while flying through a mushroom cloud. When mice and monkeys were flown through clouds during earlier tests they were placed in ventilated cages to determine the hazard from inhaling radioactive particles. The studies found that the hazard from inhalation was less than 1 percent of the external radiation hazard. As General Pinson put it, "In other words, if the internal hazard were to become significant, the external hazard would be overwhelming."<sup>109</sup> To confirm this finding, Pinson undertook a similar experiment with humans, and again, as with the Teapot experiment, Pinson was a subject as well as a researcher. To perform the experiment, no filters were installed in the penetration aircraft.<sup>110</sup> Again, it is estimated that about a dozen subjects were involved.

The military this time set the authorized dosage (the maximum dosage to which Pinson could plan to have people exposed) at 25 R and a limiting dosage (in which case a report had to be filed) at 50 R.<sup>111</sup> During the experiment

"maximum radiation dose rates as high as 800 r/hr were encountered, and several flights yielded total radiation doses to the crew of 15 r."<sup>112</sup> (To measure the internal dose of radiation the scientists analyzed urine samples and used whole-body counters.)

The project, as Pinson's final report noted, marked the transition from animal experimentation to human measurement:

Although a considerable amount of experimentation had been done with small animals which were flown through nuclear clouds, the early cloud-penetration project of Operation Redwing was the first instance in which humans were studied in a similar situation.<sup>113</sup>

The results confirmed those of the animal experiments. The internal hazard of radiation was insignificant relative to the external hazard. Consequently, the researchers recommended "that no action be taken to develop filters for aircraft pressurization systems nor to develop devices to protect flight crews from the inhalation of fission products."<sup>114</sup>

### **Experimental Purpose: Military Tactics, Money, and Morale**

Why was the Air Force interested in showing that atomic clouds could be penetrated soon after a detonation?

Most important, the military wanted to assure itself that it was safe for combat pilots to fly through atomic clouds, if need arose during atomic war. But the research did not make much of a scientific contribution. Researchers had already established the levels of radiation in atomic clouds by flying drone aircraft through them, and there was nothing pathbreaking about humans being exposed to levels of radiation under 25 R. General Pinson later noted, "there are no research people that I know of that gave a damn [about manned early cloud-penetration experiments], because this is . . . a negligible contribution to research and sci[en]ce--scientifically, you know, this contributes less than I suspect anything I've ever done . . . its only virtue is the practical use of it."<sup>115</sup>

From the scientific perspective the data would not likely be of great use; from an immediate practical perspective human data were felt to be essential for reassurance. Should the Air Force have been satisfied with the wealth of data it had from the drone experiments? In retrospect Pinson found the question difficult. "There's reason to say, 'Well, you should have been satisfied with the data that had been gathered with the drones.' But, you know, these are hard-nosed, practical people that--that put their life on the line and in military combat . . . where the hazards are far greater than in this modest exposure to radiation."<sup>116</sup>

The budget also played a key role in cloud-penetration research, as well as

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the related decontamination experiments, which will be discussed shortly. The Defense Department declared that the knowledge gained through its cloud-penetration experiments would save "the taxpayers thousands upon thousands of dollars" because there would be no need to develop special protective clothing or equipment, which had been thought to be necessary.<sup>117</sup>

As in the case of the HumRRO experiments and the troop maneuvers, indoctrination and morale were important forces behind the experimentation. "Perhaps the most important problem of all," a popular men's magazine of the day wrote about the Teapot experience, "might be a psychological resistance of combat pilots and crews flying into the unknown dangers of hot, radio-active areas."<sup>118</sup> The press, therefore, depicted the Teapot experiment as a message to the world--pilots can fly through atomic clouds safely.

**Research, Consent, and Volunteerism**

Like the HumRRO experiments, the cloud flythrough experiments were treated as occupational, rather than experimental, activities. None of the participants signed consent forms, and waivers to dose limits were sought, and approved, under the process followed for the nonexperimental flythrough activities. In 1995 General Pinson said that he had not been aware of the ethical standards declared in the 1953 secretary of defense memorandum. If he had been, he "would have gotten written consent from the people that were involved in this."<sup>119</sup>

A 1963 Air Force history of the cloud-sampling program does not describe the process of crew and pilot selection, but does provide a perspective:

The Strategic Air Command pilots picked to fly the F-84G sampler aircraft were pleased to learn that they were doing something useful, . . . not serving as guinea pigs as they seriously believed when first called upon to do the sampling.<sup>120</sup>

Did the personnel understand the risks? Some of them surely did. The aircraft carried airmen and scientific observers. Because the scientific observers were the very scientists who designed the experiments, they certainly understood the radiation risks as well as anyone could be expected to. In this way, the cloud flythrough experiments exemplified the ethic of researcher self-experimentation. As Pinson recalled in 1995, "If you are going to do something like this and you think it's safe to do it, then you shouldn't ask somebody else to do it. The way you convince other people that at least you think it's all right, is do it yourself."<sup>121</sup>

The nonscientists were briefed and informed that the risks from their radiation exposure would be minimal.<sup>122</sup> A pilot in the cloud-tracking activities recalled one of the briefings: "The scientists line up at a briefing session and tell

you there's no danger if you will follow their instructions carefully. In fact, they almost guarantee it."<sup>123</sup>

But many of the pilots seemed to have been neither worried at the prospect of risk nor excited at the prospect of glory. Pinson, for example, described the attitude of the pilot who flew his aircraft as "matter of fact."<sup>124</sup> And at Operation Teapot, Captain Paul M. Crumley, project officer for the early cloud penetrations, stated, "We consider these flights routine. Neither the pilots nor observers are unduly concerned over the fact that no one else has flown into an atomic cloud so soon after detonation."<sup>125</sup>

### **Decontamination Experiments**

In conjunction with the Teapot cloud flythrough experiment, the military also conducted an experiment on ground crews "to determine how soon these same aircraft could be reserviced and made ready to fly again."<sup>126</sup> The Air Force used the contaminated aircraft from the early cloud-penetration experiment.<sup>127</sup> The research sparked a debate between the Air Force and the AEC over the costs and benefits of safety measures, a debate that was itself resolved by further experimentation.

In one part of the "experimental procedure," personnel (the number involved is not reported) rubbed their gloved hands over a contaminated fuselage, and in another part "the bare hand was also rubbed over a surface whose detailed contamination was known and a radioautograph of the hand surfaces [was] made."<sup>128</sup> None of the "survey team" exceeded the AEC's gamma exposure limit of 3.9 R.<sup>129</sup> Concluding that aircraft did not need to be "washed down" or decontaminated after they flew through the atomic clouds, Colonel William Kieffer, deputy commander of the Air Force Special Weapons Center, proposed that decontamination procedures be eliminated except in extreme circumstances. This change in procedures might cause overexposures, Kieffer wrote, but they would be acceptable as long as "dangerous" dosages would be avoided.<sup>130</sup>

The proposal was not warmly received by the AEC. Los Alamos's Thomas Shipman complained that the goal should be to reduce exposures to zero.<sup>131</sup> Harold Plank, a Los Alamos scientist who was in charge of the cloud-sampling project and who rode along on many of the cloud-sampling missions, said, "Kieffer simply could not understand the philosophy which regards every radiation exposure as injurious but accepts minimum exposures for critical jobs."<sup>132</sup>

Kieffer suggested a compromise; test the proposal with only one or two sampler aircraft.<sup>133</sup> Plank objected, but the AEC test manager promised to "do everything possible to obtain a waiver of AEC operating radiological safety requirements."<sup>134</sup> The Air Force carried out the study during the 1957 Operation Plumbbob. An additional plane was flown through the atomic clouds created by five "events" to determine the hazard from the Air Force's proposed procedures.<sup>135</sup>

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The study showed that decontamination would be necessary to prevent overexposures at test sites.<sup>136</sup> In the end, the Air Force was unsuccessful in its attempt to change the decontamination procedures for sampler aircraft.

We do not know how the Air Force viewed this activity. Given that it did not treat the cloud flythroughs as an experiment, it is unlikely that the Air Force considered the ground personnel activity to be an experiment. There is no record of what the ground personnel were told or whether they were volunteers.

## **THE BOMB TESTS: QUESTIONS OF RISK, RECORDS, AND TRUST**

In this chapter, the Advisory Committee reviewed six different activities that were conducted in conjunction with bomb tests that today we would consider research involving human subjects.<sup>137</sup> Only two of the six--the "atomic effects experiments" conducted on officer volunteers and the flashblindness experiments--were clearly treated as instances of human research at the time. The six human research projects likely included no more than 3,000 of the more than 200,000 people who were present during the bomb tests.<sup>138</sup> Some of the research subjects, perhaps as many as several hundred, were placed at greater risk of harm than the other bomb-test participants who were not also research subjects. However, most of the research subjects were not. At this point, we turn to a consideration of several issues that affect all atomic veterans, regardless of whether they were also research subjects. These include how at the time the DOD and the AEC determined what exposures would be permitted, issues of record keeping, and what is known today about long-term risks and participation in the bomb tests.

### **AEC and DOD Risk Analysis for Exposure at Bomb Tests**

In counseling human subject research at bomb tests, the Joint Panel on the Medical Aspects of Atomic Warfare stated that the research had to be performed under "safe conditions." What "safe" meant for all those exposed, both experimental subjects and other military participants at the bomb tests, was subject to arrangements between the AEC and the DOD.<sup>139</sup> While the military, of course, is responsible for the safety of its troops, the AEC had responsibility for the safe operation of the Nevada and Pacific sites at which the weapons were tested. "Secrecy," summarized Barton Hacker, a DOE-sponsored historian of the bomb tests, "so shrouded the test program . . . that such matters as worker safety could not then emerge as subjects of public debate."<sup>140</sup>

As we have seen in the case of the cloud flythrough research, by the mid-1950s the AEC and the Defense Department had arrived at a method of operation through which waivers to the basic radiation safety standards for the tests would be granted for particular activities. In the early 1950s, in the context of the Desert Rock exercises, the AEC and the DOD established the precedent for departure

from the standards that the AEC relied on for its own bomb-test work force.

At this time the AEC was the main source of expertise on radiation effects. Its guidepost for its own workers (at the Nevada Test Site and elsewhere) was the 3 R per thirteen-week standard established for occupational risk by a private organization (the National Committee on Radiation Protection). This level, it may be recalled from the debates on nuclear airplane experimentation (discussed in chapter 8), was well below that at which the experts assumed acute radiation effects, such as would limit combat effectiveness, could occur.<sup>141</sup>

In 1951, the Los Alamos Laboratory, the AEC's right hand in weapons test management, called on the Division of Biology and Medicine's director, Shields Warren, for "official but unpublicized authority to permit exposures up to 3.9r" for AEC test personnel.<sup>142</sup> Warren granted the request, counseling that "this Division does not look lightly upon radiation excesses."<sup>143</sup>

As we have seen, the DOD shortly thereafter determined to use the tests for troop maneuvers and did so at Desert Rock I, keeping the troops at seven miles distance during the detonation. In early 1952 the DOD asked the AEC to endorse its request to station troops at Desert Rock IV as close as 7,000 yards from ground zero (approximately four miles), far closer than the seven-mile limit the AEC permitted its own test-site personnel. The AEC's Division of Military Applications was willing to concur. Shields Warren, however, dissented on grounds of safety.<sup>144</sup> The dispute was settled when AEC Chairman Gordon Dean advised DOD that "the Commission would enter no objection to stationing troops at not less than 7000 yards from ground zero," provided that proper precautions were taken.<sup>145</sup>

Even so, an internal review of the Desert Rock IV exercise by the Division of Military Applications, generally supportive of DOD's request for troop maneuvers, raised questions about the wisdom of deviation from the AEC standard--and the potential for "delayed" casualties.<sup>146</sup>

Determined to proceed, DOD called for "a study to be made to determine the minimum distance from ground zero that should be permitted in a peacetime maneuver."<sup>147</sup> A December 1952 report recommended that dosages for Army personnel be above the limit set by the AEC for its personnel. The soldiers, by comparison with the AEC personnel, would be exposed "very infrequently." The report summarized the state of knowledge:

There is no known tolerance for nuclear radiation, that is, there is no definite proof that even small doses of nuclear radiations [*sic*] may not, in some way, be harmful to the human body. On the other hand, there is no evidence to indicate that, within certain limits, nuclear radiation has injured personnel who have been exposed to it.<sup>148</sup>

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In response to the DOD's proposal to assume full responsibility for physical and radiological safety of troops and troop observers within the Nevada Test Site, the AEC stated that general safety practice and criteria at the Nevada Proving Grounds was, and must continue to be, the responsibility of the AEC. The AEC did, however, "accept the proposal that the DOD assume full responsibility for physical and radiological safety of troops and all observers accompanying troops within the maneuver areas assigned to Exercise Desert Rock V, including establishment of a suitable safety criteria." The AEC further explained that

The Atomic Energy Commission adopts this position in recognition that doctrine on the tactical use of atomic weapons, as well as the hazards which military personnel are required to undergo during their training, must be evaluated and determined by the Department of Defense.

The Atomic Energy Commission has, however, established safety limits. . . . We consider these limits to be realistic, and further, are of the opinion that when they are exceeded in any Operation, that Operation may become a hazardous one. So that we may know in which particulars and by how much these safety standards are being exceeded, we desire that the Exercise Director transmit to the Test Manager a copy of his Safety Plan. . . .<sup>149</sup>

For the spring 1953 Desert Rock V exercises, the DOD deemed the permissible limit for the troops (for a test series) to be 6 R.<sup>150</sup> In the case of the officer volunteers, a 10 R test limit was agreed to, with the proviso that "it is not intended that these exposures result in any injury to the selected individuals."<sup>151</sup> The Army's limit at Desert Rock was well below the level understood to potentially cause acute effects and far below the recommendation of Brigadier General James Cooney that the military depart from the "infinitesimal" industrial and laboratory limits and accept 100 roentgens for a single-exposure limit.<sup>152</sup> But the level was not only higher than the AEC level but also above the 0.9 R per week being urged by the British and Canadians, partners in U.S. testing.<sup>153</sup> (The AEC itself objected that a 0.9 R-per-week limit would make testing at Nevada impractical.)<sup>154</sup>

Interestingly, in 1952 the Navy, also faced with the need for more-realistic training exercises, considered spraying radioactive materials on ships during training exercises. The Navy's Bureau of Medicine (BuMed) rejected the proposal. BuMed told the chief of naval operations that while it "fully

appreciates" the need for more "realistic radiological defense training," it could not approve the use of radioisotopes in a form other than "sealed sources commonly used in basic training . . . since such use might produce an internal radiation hazard serious enough to outweigh the advantages of area contamination for training purposes."<sup>155</sup>

By the mid-1950s, AEC test health and safety staff were continually concerned about radiation safety at the tests and the failure to reduce them to a predictable and assuredly safe routine. "There are," Los Alamos Health Division leader Thomas Shipman wrote to the AEC Division of Biology and Medicine's Gordon Dunning in 1956, "two basic facts . . . which must never be lost sight of. The first of these is that the only good exposure is zero. . . . The second fact is that once the button for a bomb detonation is pushed you have to live with the results no matter what they are. . . ."<sup>156</sup> In fact, while the AEC had set a limit of 50 kilotons (more than twice the power of the Hiroshima and Nagasaki bombs) for Nevada tests, this limit had already been exceeded by 10 kilotons in 1953.<sup>157</sup> "It is all very nice," Shipman wrote in another 1956 memorandum, "to have a well-meaning Task Force commander who by a stroke of the pen can absolve our radiologic sins, but somehow I do not believe that overexposures are washed away by edict."<sup>158</sup> Shipman's comments illustrate an acute awareness among experts at the center of the testing program of the real and continuing element of risk and uncertainty in the attempt to define and control exposures at the bomb tests.

### **The Aftermath of Crossroads: Confidential Record Keeping to Evaluate Potential Liability Claims**

In the midst of the Korean and Cold Wars, researchers and generals were focused on the short-term effects of radiation, not effects that might take place years later. Thus, the benefits from knowledge about the bomb, or training of troops in its use, loomed large, and the risks from long-term exposure likely seemed distant and small. Government officials undertook to guard against acute radiation effects; the surviving documentation indicates that they were remarkably successful. Of the more than 200,000 service participants in the tests, available records indicate that only about 1,200 received more than today's occupational exposure limit of 5 rem, and the average exposure was below 1 rem.<sup>159</sup> But there was no certainty that lower exposures were risk free.

During the summer of 1946, the contamination of ships at the Crossroads tests put officials and medical experts on alert to the radiation risk posed to participants at atomic bomb detonations. "[D]ifficult and expensive medico legal problems," Crossroads medical director Stafford Warren feared, "will probably occur if previously contaminated target ships are 'cleared' for constant occupancy or disposal as scrap."<sup>160</sup> A "Medico-Legal Advisory Board" sought to deal with these questions,<sup>161</sup> and the Navy created a research organization dedicated to the

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study of decontamination and damage to ships.<sup>162</sup>

Concern for long-term liability stimulated by Crossroads led to more steps to guard against the legal and public relations implications if service personnel exposed to radiation filed disability claims.

In the fall of 1946, General Paul Hawley, administrator of the Veterans Administration, "became deeply concerned about the problems that atomic energy might create for the Veterans Administration due to the fact that the Armed Services were so actively engaged in matters of atomic energy."<sup>163</sup> In August 1947 Hawley met with representatives of the surgeon general's offices of the military services and the Public Health Service.<sup>164</sup> The meeting was also attended by former Manhattan Project chief General Leslie Groves,<sup>165</sup> (Groves reportedly was "very much afraid of claims being instituted by men who participated in the Bikini tests.")<sup>166</sup> An advisory committee was created, which included Stafford Warren and Hymer Friedell, Warren's deputy on the Manhattan Project medical team. The committee was given the name "Central Advisory Committee," as "it was not desired to publicize the fact that the Veterans Administration might have any problems in connection with atomic medicine, especially the fact that there might be problems in connection with alleged service-connected disability claims."<sup>167</sup>

The committee recommended the creation of an "Atomic Medicine Division" of the VA to handle "atomic medicine matters" and a radioisotope section to "implement a Radioisotope Program."<sup>168</sup> The committee further recommended that "for the time being, the existence of the Atomic Medicine Division be classified as 'confidential' and that publicity be given instead to the existence of a Radioisotope Program."<sup>169</sup>

This history is contained in a 1952 report presented by Dr. George Lyon to the National Research Council.<sup>170</sup> The 1952 report records that "General Hawley took affirmative actions on these recommendations and it was in the manner described that the Radioisotope Program was initiated in the Fall of 1947."<sup>171</sup> Lyon, who had worked with Stafford Warren at Crossroads, was appointed special assistant to the VA's chief medical director for atomic medicine, and through 1959 served in a variety of roles relating to the VA's atomic medicine activities. Dr. Lyon's 1952 report recounts that he was present at the August 1947 meeting and involved in the deliberations of the Central Advisory Committee, as well as subsequent developments.<sup>172</sup>

Working with the VA and the Defense Department, we sought to retrieve what information could be located regarding the Atomic Medicine Division and any secret record keeping in anticipation of potential veterans' claims from radiation overexposures. Among the documents found was a Confidential August 1952 letter to the attention of Dr. Lyon, in which the Defense Department called for comment on the Army's proposal to "eliminate the requirement for maintaining detailed statistical records of radiological exposures received by the Army personnel."<sup>173</sup> The requirement, the letter recorded, "was originally

conceived as being necessary to protect the government's interest in case any large number of veterans should attempt to bring suit against the government based on a real or imagined exposure to nuclear radiations during an atomic war."<sup>174</sup>

In 1959 Dr. Lyon was recommended for a VA "Exceptional Service Award."<sup>175</sup> In a memo from the VA chief medical director to the VA administrator, Dr. Lyon's work on both the publicized and confidential programs was the first of many items for which Dr. Lyon was commended. Following a recitation of the 1947 developments similar to those stated by Dr. Lyon in his 1952 report, the memo explained:

It was felt unwise to publicize unduly the probable adverse effects of exposure to radioactive materials. The use of nuclear energy at this time was so sensitive that unfavorable reaction might have jeopardized future developments in the field . . . [Dr. Lyon] maintained records of classified nature emanating from the AEC and the Armed Forces Special Weapons Project which were essential to proper evaluation of claims of radiation injury brought against VA by former members of the Armed Forces engaged in the Manhattan project.<sup>176</sup>

The Advisory Committee has been unable to recover or identify the precise records that were referred to in the documents that have now come to light. An investigation by the VA inspector general concluded that the feared claims from Crossroads did not materialize and that the confidential Atomic Medicine Division was not activated.<sup>177</sup> However, the investigation did not shed light on the specific identity of the records that were kept by Dr. Lyon, as cited in the 1959 memo on behalf of his commendation.<sup>178</sup> While mystery still remains, the documentation that has been retrieved indicates that prior to the atomic testing conducted in the 1950's, the government and its radiation experts had strong concern for the possibility that radiation risk borne by servicemen might bear longer-term consequences.

### **Looking Back: Accounting for the Long-Term Risks**

Civilians, a UCLA psychologist observed during a 1949 NEPA meeting convened to consider the psychology of radiation effects, question "whether the medical group have actually discovered thus far all the effects of radiation on human beings . . . that is going to be one of the most insidious things to combat. . . ."<sup>179</sup> "[W]hen you talk about probable delayed effects possible, unknown, and so forth," Dr. Sells, of the Air Force, asked, "what is the proper

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evaluation of the ethical question as to how to treat the possible or probable unknown effects?"<sup>180</sup> While not answering the question, he observed that "certainly we can create more anxiety by being scientifically scrupulous than if we simply treated these matters as we are inclined to treat other matters in our every-day life."<sup>181</sup>

This may have been the case following Crossroads. "Now we are very much interested in long-term effects," a military participant in a 1950 meeting of the DOD Committee on Medical Sciences stated, "but when you start thinking militarily of this, if men are going out on these missions anyway, a high percentage is not coming back, the fact that you may get cancer 20 years later is just of no significance to us."<sup>182</sup>

Decades following the 1946 Crossroads tests, researchers began to study the longer-term effects of the bomb on test participants.

In 1980 the Centers for Disease Control (CDC) reported a cluster of 9 leukemias among the 3,224 (then identified) participants of shot Smoky at the Nevada Test Site in 1957.<sup>183</sup> A later report<sup>184</sup> increased the count of leukemias to 10 compared with 4.0 expected on the basis of U.S. rates, but found no excess cancers at other anatomical sites (the total observed was 112, compared with 117.5 expected). The Smoky test was the highest-yield tower shot ever conducted at the Nevada Test Site; however, the measured doses for the Smoky participants as a group were too low to explain the excess. Whether this cluster represents a random event, an underestimation of the doses for the few participants who got leukemia, or some other explanation remains unclear.

In light of the CDC research, the National Academy of Sciences (NAS) thereafter undertook an enlarged study of five series of nuclear tests totaling 46,186 (then identified) participants.<sup>185</sup> The 1985 NAS report confirmed the excess of leukemia at the Smoky test but found no such excess at any of the test series (as opposed to individual tests) and no consistent pattern of excesses at other cancer sites. Later, however, the NAS study was found to be flawed by the inclusion of 4,500 individuals who had never participated and the exclusion of 15,000 individuals who had participated in one or more of the five series, as well as incompleteness of dosimetry.<sup>186</sup>

The belated discovery that thousands of test participants had been misidentified punctuated the deficiencies in record creation and record keeping faced by those who seek to reconstruct, at many years' remove, the exposures of participants at the tests.

Documents long available, and those newly retrieved by the Committee, provide further basis for concern about the data gathering at test series in which human subject research took place. At the 1953 Upshot Knothole series, which included the Desert Rock V HumRRO research, 1994 DOD data show that only 2,282 of the 17,062 participants are known to have been issued film badges to serve as personal dosimeters.<sup>187</sup> At Desert Rock V, the Army surgeon general's policy that one-time exposure need not be reported led to a determination that

maneuver troop units would be issued one film badge per platoon, and observers would be issued one per bus.<sup>188</sup> An AFSWP memo recorded that the Radiological Safety Organization did not have enough pocket dosimeters for efficient operation.<sup>189</sup> A recently declassified DOD memo records that "[a]lthough film badges on the officer volunteers [at Desert Rock V] indicated an average gamma dose of 14 roentgens, best information available suggests that the true dose was probably 24 rem initial gamma plus neutron radiation."<sup>190</sup>

In a 1995 report, the Institute of Medicine found that the dose estimates that were proposed for use in the NAS follow-up study were unsuitable for epidemiologic purposes, but concluded that it would be feasible to develop a dose-reconstruction system that could be used for this purpose. Nonetheless, there are some further studies that are of direct relevance.<sup>191</sup>

Recently, Watanabe et al.<sup>192</sup> studied mortality among 8,554 Navy veterans who had participated in Operation Hardtack 1 at the Pacific Proving Grounds in 1958. This is, to date, the only study of U.S. veterans to include a control group of unexposed military veterans. Overall, the participant group had a 10 percent higher mortality rate, but the cancer excess was significant only for the combined category of digestive organs (66 deaths compared with 44.9 expected, a 47 percent increase). On average, the radiation doses were low (mean 388 mrem), but among the 1,094 men with doses greater than 1 rem, there was a 42 percent excess of all cancers. No categories of cancer sites showed a significant excess or clear dose-response relationship, but the number of deaths in any category was small.

Two sets of foreign atomic veterans have been studied. In a study of 954 Canadian participants,<sup>193</sup> no differences with matched controls were found, but only very large effects would have been detectable in such a small study. In contrast, a large study of British participants of test programs in Australia found higher rates of leukemia and multiple myeloma than in a matched control group (28 vs. 6).<sup>194</sup> However, the cancer rates among the exposed veterans were only slightly higher than expected based on national rates, whereas those in the control group were much lower than expected, and there was no dose-response relationship. No excess was found at any other cancer site. Although the difference between the exposed and unexposed groups was quite significant, the interpretation of this result is unclear. Does it mean that for some unknown reason, soldiers are less likely than the general population to get cancer (the "healthy soldier effect," which is usually not thought to be so large for cancer), or is it an indication of some unexplained methodological bias? This point has never been resolved.

These observed effects need to be put in the context of what might reasonably be expected based on current understanding of low-dose radiation risks and the doses the atomic veterans are thought to have received. Approximately 220,000 military personnel participated in at least one nuclear test. The film badges for those monitored (thought to be roughly representative of all

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participants) average 600 mrem.<sup>195</sup> As summarized in "The Basics of Radiation Science" section of the Introduction, the consensus among scientific experts is that the lifetime risk of fatal cancer due to radiation is approximately 8 per 10,000 person-rem. On this basis, one might anticipate approximately 106 excess cancer deaths attributable to participation in the nuclear tests. Not only is this a number with considerable uncertainty, it is small in comparison with the total of about 48,000 cancer deaths that are eventually anticipated in this population.

Such a small overall excess would be virtually impossible to detect by epidemiologic methods. In some subgroups, however, the relative increase above normal cancer rates could be large enough to be detectable. Leukemia, for example, is proportionally much more radiosensitive than other cancers and the largest excess occurs fairly soon after exposure, when natural rates are low. Focusing on those with highest exposure would also enhance the relative increase, albeit with many fewer people at risk. The Defense Nuclear Agency estimates that about 1,200 veterans received more than 5 rem (mean 8.1 rem).<sup>196</sup> On this basis, about eight excess cancer deaths would be anticipated. These factors may have contributed to the observed leukemia excess among participants of shot Smoky, for example.

Although these numbers represent the best estimate currently available of the expected cancer excess, there are uncertainties in both the real exposures received by the participants and the magnitude of the low-dose risk. As described in "The Basics of Radiation Science" section, there is roughly a 1.4 uncertainty in the low-dose radiation risk coefficient simply due to random variation in the available epidemiologic data, with additional uncertainties of unknown magnitude about model specification, variation among studies, extrapolation across time and between populations, unmeasured confounders, and so on. These uncertainties are hotly contested, although the majority of radiation scientists believe the figures quoted above are unlikely to be seriously in error. If low-dose radiation risks were indeed substantially higher than this, then there would be a serious discrepancy to explain with the effects actually observed at higher doses. The uncertainties in the doses received by participants are perhaps more substantial, but given the limitations in the dosimetry and record keeping, it may be difficult ever to resolve them.

As is clear from the epidemiologic data available today, there is no consistent pattern in increased cancer risk among atomic veterans, although there are a number of suggestive findings, most notably the excesses of leukemia among shot Smoky and British test participants, the causes of which are still unclear. The low recorded doses, the small size of the expected excesses, and problems in record keeping and dosimetry make it very difficult to resolve whether atomic veterans as a group are at substantially elevated cancer risk and whether any such excess can be attributed to their radiation exposures. The Advisory Committee debated at some length the merits of further epidemiologic

studies and concluded that the decisions to conduct such studies should be made by other appropriately constituted bodies of experts.

### **Looking Back: The Legacy of Distrust**

The chain of events set in motion by the CDC research, and renewed interest in the fate of the "atomic vets," led to congressional enactment of legislation that provides veterans exposed at atmospheric tests with the opportunity to obtain compensation for injury related to radiation exposure.

The Veterans Dioxin and Radiation Exposure Compensation Standards Act of 1984 provides for claims for compensation for radiation-related disabilities for veterans exposed at atmospheric tests. The Radiation Exposed Veterans Compensation Act of 1988 provides that a veteran who was exposed to radiation at a designated event and develops a designated disease may be entitled to benefits without having to prove causation.<sup>197</sup>

Norwithstanding the passage of this legislation, the Committee heard from many atomic veterans, and their widows, who complained that the records that were created and maintained by the government--records on which veterans' claims may stand or fall--were inadequate, missing, or wrong.<sup>198</sup> Atomic veterans also stated that the laws and rules do not adequately reflect the kinds of illnesses that may be caused by radiation, that they do not provide for veterans who were exposed to radiation in settings other than atmospheric tests, and that the practical difficulties--in time and resources--of pursuing their rights under the laws are often excessive. The Committee heard from many who told of the time, expense, and difficulty of getting information on the full circumstances of bomb-test exposures. They told of their continued efforts, over the course of the years, to reconcile what they have learned from government sources with that which they have been told by other test participants, that which they recovered from the private letters of test participants to family members, and their own further research.

For numerous atomic veterans, the testimony was not simply that the bomb tests themselves had been large experiments, but that they had been put at risk in the absence of planning to gather the data and perform the follow-up studies needed to ensure that the risks of the unknown, however small, would be measured and adequately accounted for.

## **CONCLUSION**

The story of human research conducted in connection with nuclear weapons tests illustrates the difficult questions that are raised when human research is conducted in an occupational setting, especially a setting, such as the military, where exposure to risk is often part of the job. The story illustrates that it may often be difficult to discern whether or not an activity is a human

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experiment. By the same token, it also illustrates the importance of guarding participants against unnecessary risks, whether or not the activity is a human experiment.

Human experiments at atomic bomb tests were undertaken by the military, which had a long tradition of requiring voluntary consent from participants in biomedical experiments. The need for written consent in experiments related to atomic, biological, and chemical warfare was clearly stated in the secretary of defense's 1953 memorandum. That memorandum also required the approval in writing of the appropriate service secretary and precluded experiments that did not adhere to its further requirements. The 1953 memorandum, however, does not appear to have been transmitted to those involved in human research at bomb tests, although the tenet of voluntary consent was followed in some cases. In addition to consent, the 1953 memorandum contained other significant ethical requirements, including that research be reasonably likely to produce useful scientific results and that proper precautions be taken to minimize risk.

The bomb-test research illustrates the significance of the position that bad science is bad ethics. Unless a research project is scientifically defensible, there is no justification for imposing on human subjects even minimal risk or inconvenience. For example, the DOD's biomedical advisers advocated the conduct of psychological and physiological research on troops participating in bomb tests with an awareness that the likelihood of scientifically useful results was small and that the effort would be part of a larger exercise in indoctrination and training. Having done so, they had an obligation to at least review continued research efforts to determine if the research design was developing useful information. In the case of the psychological and physiological testing, the evidence indicates that early results showed that the research design was not likely to produce useful scientific information, if only because the military, the researchers, and perhaps even the subjects did not view the setting as sufficiently realistic.

At the same time, this question of ethics and science is irrelevant if the HumRRO activities did not entail research involving human subjects. An activity that has a poor research design would not be an ethical human experiment. However, the same activity might be ethical if conducted as a training activity whose essential purpose is to provide reassurance. Similarly, to the extent that research was intended solely to provide reassurance, ethical questions arise that might not be present if the activity were not experimental.

Just what makes something an instance of research involving human subjects? The answer to this question is not discoverable; instead, it is fashioned by people in particular contexts for particular purposes. Today, we would likely consider all the activities reviewed in the first part of this chapter--the HumRRO testing, the "atomic effects experiment," the flashblindness experiments, the cloud flythroughs, and the protective clothing and decontamination tests--to be cases of research involving human subjects to which the current federal regulations and

the current rules of research ethics would apply. Some of these activities are, nevertheless, more paradigmatically instances of human research than others. Depending on the context, for example, the protective clothing and decontamination tests might be considered within the normal course of duty for military personnel.

One of the reasons it is important to be able to distinguish research involving human subjects from other activities is that military policy clearly states that service personnel may not be ordered to be human subjects. In contrast to much else in military service, participation in research is a discretionary activity that service personnel are permitted under military policy and federal regulation to refuse. Thus, in the military as elsewhere, human subjects are supposed to be volunteers whose valid consent has been obtained.

Human subject research is not the only activity in the military, however, for which consent is a requirement. The military also often asks for volunteers in settings where the risk is unusually great. For example, the testing of equipment may often be hazardous, may involve the use of volunteers, but may not be considered human research. Thus, in the case of test pilots, there may be significant risk, volunteers may be called for, but the activity might not be considered research with human subjects and thus would not be thought subject to human use research regulations.

Conversely, a requirement of consent may not necessarily mean that subjects have some measure of control over the risks to which they are to be exposed. Even under today's rules, informed consent in the HumRRO tests would be limited to the psychological and physiological testing, and not required for participation in the bomb test itself.

Whether the activity is research involving human subjects or an unusually risky assignment that is not considered human subject research, how free are military personnel to accept or refuse offers (as opposed to orders) put to them? Dr. Crawford, when asked to comment in 1994 on consent in his HumRRO research, responded by observing that "military service people generally do what they're asked to do, told to do." He was speaking of an army that included many conscripts; today's all-volunteer military is doubtless different in many respects that bear on questions of voluntariness. Nevertheless, the culture of the military, with its emphasis not only on following orders but on the willingness to take risks in the interests of the nation, surely influences and in some circumstances may restrict how service personnel respond to such offers.

Because in the military volunteering is often seen as a matter of duty and honor, and the boundaries between experimental and occupational activities may not be clear, the importance of minimizing risk emerges as a central concern. Above all, the activities discussed in this chapter confirm that the ethical requirement that risks to service personnel be minimized should not depend on whether an activity is characterized as an experiment or occupational. In the case of the atomic veterans, the risks run were usually no different for those who were

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subjects of research and those who were not.

The military took precautions, with great success, to preclude exposure to radiation at levels that might produce acute effects. However, bomb-test participants were exposed to lesser, long-term risks without adequate provision for (1) the creation and maintenance of records that might be needed, in retrospect, to determine the precise measure of risks to which military personnel were exposed; (2) the tracking of those exposed to risk, so that follow-up and assurance, as needed, could be efficiently undertaken.

It might be argued that, at the time, there was no awareness of a potential for long-term risk, or that the potential was understood to be nonexistent. But, while the possibility of long-term risk from low exposures was seen as low, it was not seen as nonexistent. Following the 1946 Crossroads tests, officials and experts connected with the DOD, AEC, and VA thought action was needed to collect data in secret to evaluate potential disability claims.

Since the bomb tests, the Defense Department has come to recognize the importance of providing for an independent risk assessment when service personnel may be exposed to new weapons--regardless of whether the exposure is classed as experimental or occupational.<sup>199</sup>

However, for the numerous atomic veterans (and their family members) who spoke to the Committee, a continuing source of distress is not simply that the government put service personnel at risk but that, having undertaken to do so, the government did not undertake to collect the data and perform the follow-up that might provide them knowledge and comfort in later years. The Advisory Committee agrees. When the nation exposes servicemen and women to hazardous substances, there is an obligation to keep appropriate records of both the exposures and the long-term medical outcomes.

From listening to those who appeared before us, and from reflection on the laws that are already in effect, the Committee came to appreciate that there are several reasons record keeping is important. First, those who served, and their widows and surviving family members, have a great interest in knowing the facts of service-related exposures. We repeatedly heard from veterans and family members whose inquiries into the circumstances and details of exposures has spanned many years. Second, information may provide basis for scientific analysis that may shed light on the relation between exposure to risk and subsequent disability or disease. Third, where disability or disease appears to be a possible result of exposure, data are needed to provide the basis for a fair and efficient system of remedies.

The experience of the bomb-test participants indicates that several different kinds of records or data should be of use. First, of course, there are data about the exposure of individual service personnel to particular potential hazards. In the case of the atomic bomb tests, the potential that radiation would be a hazard was, of course, obvious. In addition, radiation is a phenomenon that is almost uniquely susceptible to measurement. In other settings faced by service

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personnel, the precise nature of the hazard may not be easily anticipated or, even if anticipated, readily measurable. Second, there are data concerning the location of service personnel. In the case of the bomb tests, as we have seen, data on the identity and location of all test participants (so that their position in relation to the putative hazard can be retrospectively reconstructed, if need be) were not readily available. Even if the hazard cannot be anticipated, such data can be useful in later efforts to reconstruct the nature of the hazard and its effect. Third, the maintenance of complete medical records, including linkages where multiple sets of records exist, is essential. Records suitable for use in epidemiologic studies of long-term medical consequences of military actions would be valuable for both medical science and service members.

But having heard from many atomic vets and their family members, the Advisory Committee does not believe that, but for the inadequate record keeping and lack of follow-up, there would be no anger or disappointment among atomic veterans and their families. The real offense to many is the belief that the risk was unacceptable and that they or their loved ones may suffer illness unnecessarily as a consequence. Proper attention to record keeping should provide some basis for gaining and assuring the trust of those who are exposed to risk in the future and, perhaps, scientific results that may be of real value to them, but it is hardly a guarantee against perceptions of abuse or unfairness.

If nothing else, our experience makes us appreciate the difference between technical, analytic data and the reality of the human experience. The available data, as we have discussed, indicate that the *average* amount of radiation to which bomb-test participants were exposed was low. But those who believe they have suffered as a consequence of these exposures do not believe these risks to have been as slight as the data indicate. When we review this decades later, we rely on numbers; the atomic veterans and their family members who have appeared before the Committee associate, in a "cause and effect" way, the exposure with some kind of result that they have personally experienced or witnessed. The emotions and concerns expressed to the Committee by these citizens (and those downwind from atomic tests and intentional releases) were very, very real. Both the public and the scientific community must understand that, when data indicate that risks are low, the risks are not necessarily zero; and it is possible for a rare event to occur. The risk analysis may only indicate that it is unlikely that such events will occur with significant frequency or probability.

## ENDNOTES

1. See Department of Energy, *Announced United States Nuclear Tests: July 1945 Through December 1992* (Springfield, Va.: National Technical Information Service, May 1993); Department of Energy, *Expanded Test Information for Nuclear Tests With Unannounced Simultaneous Detonation* (Springfield, Va.: National Technical Information Service, 20 June 1994).

2. Thomas L. Shipman, Los Alamos Laboratory Health Division Leader, to Dr. Harry G. Ehrmentraut, Committee on Medical Sciences, Research and Development Board, Department of Defense, 25 July 1951 ("Dr. Robert Grier has passed on to me . . .") (ACHRE No. DOE-033195-B), 2.

3. See the July 1949 transcript of a meeting convened by the NEPA [Nuclear Energy for the Propulsion of Aircraft] Medical Advisory Panel to discuss the "Psychological Problem of Crew Selection Relative to the Special Hazards of Irradiation Exposure." 27. NEPA Medical Advisory Panel, Subcommittee IX, proceedings of 22 July 1949 (ACHRE No. DOD-121494-A-2).

4. Richard L. Meiling, Chairman, Armed Forces Medical Policy Council, to the Deputy Secretary of Defense et al., 27 June 1951 ("Military Medical Problems Associated with Military Participation in Atomic Energy Commission Tests") (ACHRE No. DOD-122794-B), 1.

5. Ibid.

6. Ibid.

7. Department of the Army, September 1950 ("Atomic Energy Indoctrination") (ACHRE No. DOD-020395-D), 73.

8. Ibid.

9. Richard L. Meiling, Chairman, Armed Forces Medical Policy Council, to the Chairman, Research and Development Board, 23 February 1951 ("Department of Defense Biomedical Participation in Atomic Weapons Tests") (ACHRE No. NARA-071194-A), 1.

10. The Joint Panel was created in 1949 by the Committee on Medical Sciences and the Committee on Atomic Energy, which were committees of the Research and Development Board. (See the Introduction and chapter 1 for further discussions of the Joint Panel.)

11. The agenda noted that while civilians were polled in the preparation of the draft, "very few" responded. The draft was therefore "offered not as a proposed statement, to be accepted after only minor revisions, but as a general guide to the type of paper which is expected of the Joint Panel." Joint Panel on the Medical Aspects of Atomic Warfare, 20 September 1951 ("Agenda, 8th Meeting, Item 3 - Preparation of Statement on Biomedical Participation in Future Weapons Tests") (ACHRE No. DOD-072294-B), 1-2.

12. Joint Panel on the Medical Aspects of Atomic Warfare, 20 September 1951 ("Biomedical Participation in Future Atomic Weapons Tests [Attachment to Agenda, 8th Meeting]") (ACHRE No. DOD-072294-B), 2. The quoted language appears to have come from Dr. Thomas Shipman of Los Alamos. See Thomas Shipman, Los Alamos Laboratory Health Division Leader, to Shields Warren, Director, AEC Division of Biology and Medicine, 15 September 1951 ("Permissible Exposures, Test Operations") (ACHRE No. DOE-120894-C).

13. The draft stated a concern that "actual animal exposures should be limited as much as possible," but did not expressly address human experimentation. Joint Panel on the Medical Aspects of Atomic Warfare, 20 September 1951, ("Biomedical Participation in Future Atomic Weapons Tests"), 3.

14. *Ibid.*, 5-7.

15. We discuss the data gathering on radioisotopes in the body fluids in chapter 13, in the context of a discussion of secret human data gathering on fallout.

16. Joint Panel on Medical Aspects of Atomic Warfare, 20 September 1951 ("Program Guidance Report") (ACHRE No. DOD-072294-B), 23.

17. *Ibid.*, 20. A further section on "Psychological Studies" recommended the following:

4.1.3 Continue studies in psychology of panic.

4.1.4 Seek technics [*sic*] for reducing apprehension and for producing psychologic resistance to fear and panic, especially in presence of radiation hazard (emotional vaccination).

4.1.5 Spread knowledge of radiation tolerance, technics [*sic*] of avoidance, and possibility of therapy through military and civilian populations and measure their acceptance.

4.1.6 Prepare to make psychologic observations at and after bomb tests.

*Ibid.*, 14.

18. Colonel Michael Buckley, Acting Deputy Assistant Chief of Staff, Research and Development, to Chief of Army Field Forces, Fort Monroe, Virginia, 20 August 1951 ("Proposed Study of Behavior of Troops Exposed to A-Bomb") (ACHRE No. NARA-013195-A), 1.

19. Peter A. Bordes et al., February 1953 ("DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion [HumRRO-TR-1]") (ACHRE No. CORP-111694-A), 3.

20. Dr. Meredith Crawford, interview by Dan Guttman and Patrick Fitzgerald (ACHRE), transcript of audio recording, 1 December 1994 (ACHRE Research Project Series, Interview Program File, Targeted Interview Project), 6-7. Dr. Crawford was recruited to head the new HumRRO by psychologist Harry Harlow, an Army adviser who was famed for his work with monkeys. HumRRO was a private contractor created at the Army's behest and initially affiliated with George Washington University. In the 1951 experiments, HumRRO worked with the Operations Research Organization (ORO), which was affiliated with Johns Hopkins University.

21. In 1994, Dr. Crawford prepared a retrospective memorandum titled "HumRRO Research During Four Army Training Exercises." Based on the 1953 report, "A Psychological Study of Troop Reactions to an Atomic Explosion," Dr. Crawford estimated that 633 service personnel were involved in the maneuvers at Desert Rock I. Meredith P. Crawford to William C. Osborn, 27 January 1994 ("HumRRO Research During Four Army Training Exercises Involving Atomic Weapons--1951-1957") (ACHRE No. CORP-112294-B), 8. In addition, hundreds of additional troops were involved as the "nonparticipant" group (which did not attend the test maneuvers, but was given psychological tests). The "experimental paradigm" for the HumRRO tests is

described in this 1994 memorandum. *Ibid.*, 4.

22. "Armed Forces: Exercise Desert Rock," *Time*, 12 November 1951, 21-22.

23. *New York Times*, 1 November 1951, 4.

24. Bordes et al., "DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion," 6.

25. Interview with Crawford, 1 December 1994, 57.

26. Bordes et al., "DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion," 5.

27. *Ibid.*, 103.

28. *Ibid.*, 107-108.

29. Interestingly, the troops evidently did not buy the "correct" answer; only about 40 percent of the troops at the maneuver were reported to have been correctly indoctrinated. Bordes et al., "DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion," 130.

30. The Committee asked the DOD to review the 1951 questionnaire and comment on whether the information presented regarding the effect of an airburst is, based on DOD's current expert understanding, still correct. DOD provided "changes/corrections/clarifications" on nine items. In the case of items 1 and 6, quoted in the text, DOD commented:

1) As stated, the answer is wrong. The ground zero hazard 1 day after an atomic explosion depends on the yield. At 20 kt, there would be no fallout for a burst at 2000 feet, but there would be induced activity. . . .

6) There is the same problem with this answer as with 1, above.

In one case the DOD reported that the 1951 questionnaire erred on what might be called the side of caution: where a 1951 answer stated that a posited detonation would not kill anybody beyond the range of three miles, the answer today would be one mile. Department of Defense, Radiation Experiments Command Center, 26 April 1995 ("ACHRE Request 032795-A, HumRRO Questionnaire and Air Burst Material") (ACHRE No. DOD-042695-A), 1.

31. Colonel R. G. Prentiss, Executive Officer, Office of the Army Surgeon General, to Chief, Army Field Forces, Fort Monroe, Virginia, 9 January 1952 ("Psychiatric Research in Connection with Atomic Weapon Tests Involving Troop Participation") (ACHRE No. DOD-080594-A), 1. The memo recorded:

1. For your information in connection with planning for future exercises and operations in which atomic weapons tests will be used and troops will participate, this office has a continuing interest in the conduct of psychiatric observations regarding the effects of the weapons on the participating troops.

2. Funds for the conduct of psychiatric observations which may be approved for future atomic weapons tests will be made available through the Surgeon General.

The memorandum bears concurrences from the "Medical Research and Development Board," "Medical Plans and Operations," "Fiscal Division," and "Chief, Psychiatry and Neurology Consultants Division." It is not clear what role Army psychiatrists (i.e., medical doctors) played in the implementation of the "psychological" experiments.

32. Major P. C. Casperson, for the Chief of Army Field Forces, to First Army et. al., 7 March 1952 ("Extracts, Final Report Exercise DESERT ROCK I") (ACHRE No. NARA-013195-A), 122. In an age of "polls and questionnaires," the report suggested, the overpsychologized troops may have been putting the psychologists on:

The psychological evaluators, of whom there were many and various, were perhaps too obvious and eager. This is an era of polls and questionnaires and here was a new and untried field with unlimited possibilities. The ultimate response, finally, was a humorous and deliberate program in the troops to confuse the psychological people with fictitious reactions.

Ibid.

33. Brigadier General A. R. Luedecke, AFSWP, to Director, AEC Division of Military Application, 7 March 1952 ("Reference is made to your letter of 28 December 1951 . . .") (ACHRE No. NARA-010495-A), 2.

34. Interview with Crawford, 1 December 1994, 12-13.

35. Dr. Crawford's 1994 reconstruction of events estimated that 672 soldiers witnessed the shot, and 914 served in the control group as nonparticipants. Crawford to Osborn, 27 January 1994, 10.

36. Motivation, Morale, and Leadership Division, Department of the Army, August 1953 ("Desert Rock IV: Reactions of an Armored Infantry Battalion to an Atomic Bomb Maneuver [HumRRO-TR-2]") (ACHRE No. CORP-111694-A), ix, 17.

37. Benjamin W. White, 1 August 1953 ("Desert Rock V: Reactions of Troop Participants and Forward Volunteer Officer Groups to Atomic Exercises") (ACHRE No. CORP-111694-A), 10.

38. Department of the Army, "Desert Rock IV: Reactions of an Armored Infantry Battalion to an Atomic Bomb Maneuver [HumRRO-TR-2]," 72.

39. "Armed Forces: Exercise Desert Rock," *Time*, 12 November 1951, 22. At Desert Rock I, physiological testing, including the use of a polygraph, sought to measure anxiety before and after D-Day. Bordes et al., "DESERT ROCK I," chapter 6. At Desert Rock IV, before and after "sweat tests" measured troops' hand sweating as a possible index of fear. Department of the Army, "Desert Rock IV: Reactions of an Armored Infantry Battalion to an Atomic Bomb Maneuver [HumRRO-TR-2]," 10.

40. Joint Panel on the Medical Aspects of Atomic Warfare, 9 September 1952 ("Minutes: 9, 10, 11 and 12 September 1952, Los Alamos Scientific Laboratory") (ACHRE No. DOD-072294-B), 3-4. The panel's statement was in the form of a motion to be transmitted to the DOD Research and Development Board's Committee on Human Resources, to which the advisory role on the HumRRO effort was being turned over.

41. The available research reports do not indicate the numbers of participants in the research.

42. Defense Nuclear Agency, 8 August 1995 ("Atmospheric Test Series/Activities Matrix") (ACHRE No. DOD-081195-A).

43. Robert D. Baldwin, March 1958 ("Staff Memorandum: Experiences at Desert Rock VIII") (ACHRE No. CORP-111694-A). Also at Plumbbob was an experiment to test the efficiency of fallout shelters. Sixteen men were confined in four shelters to collect fallout samples, so that their ability to collect samples could be studied and so that they could be studied for the psychological effect of confinement. The study concluded that the shelters were well suited for both manned stations at nuclear weapons tests and for single-family fallout shelters. J. D. Sartor et al., 23 April 1963 ("The Design and Performance of a Fallout-Tested Manned Shelter Station and Its Suitability as a Single-Family Shelter [USNRDL-TR-647]") (ACHRE No. CORP-032395-A). See also Nevada Test Organization, Office of Test Information, 24 July 1957 ("For Immediate Release") (ACHRE No. DOE-033195-B); Nevada Test Organization, Office of Test Information, 15 July 1957 ("For Immediate Release") (ACHRE No. DOD-030895-F).

44. Baldwin, "Experiences at Desert Rock VIII," 39.

45. *Ibid.*, 12. The troops were not to be told the amount of contamination present, which would depend upon actual fallout amounts. The course was marked by radiation hazard markers, which might or might not reflect the actual fallout. *Ibid.*, 23.

46. *Ibid.*, 7.

47. Interview with Crawford, 1 December 1994, 52.

48. Bordes et al., "DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion," 20.

49. Crawford to Osborn, 27 January 1994, 15.

50. CG Cp Desert Rock to CG Sixth Army, 28 March 1953 ("Reference message G3, OCAFF No. 423") (ACHRE No. NARA-013195-A), 1. The office volunteers participated in three detonations in the 1953 "Upshot-Knothole" series--shots Nancy, Badger, and Simon. "DNA Fact Sheet Operation Upshot-Knothole," January 1992.

51. Captain Robert A. Hinners, USN, Headquarters, Armed Forces Special Weapons Project, 25 April 1953 ("Report of Participation in Selected Volunteer Program of Desert Rock V-7") (ACHRE No. DOE-033195-B), 2.

In an 11 February 1953 letter, the Army informed the Congressional Joint Committee on Atomic Energy of the "steps being taken by the Army in connection with exposure of troops at tests of atomic weapons." Lieutenant General L. L. Lemnitzer, Deputy Chief of Staff for Plans and Research, to Honorable Carl T. Durham, House of Representatives, 11 February 1953 ("The Secretary of the Army has asked that the Joint Committee . . .") (ACHRE No. NARA-112594-A), 1. The Army explained that deployment in foxholes at as close to 1,500 yards was needed to confirm that commanders could risk troops at this distance. The Army assured the committee that experts deemed it "highly improbable that troops will suffer any injury under these conditions." *Ibid.*, 2.

Assurance was given to Congress that no more than twelve volunteers would be used at one shot. G3 DEPTAR, to CG Cp Desert Rock, 15 April 1953 ("Reference your msg AMCDR-DPCO 0498") (ACHRE No. NARA-013194-A), 1.

52. Brigadier General Carl H. Jark, for the Assistant Chief of Staff, Organization and Training Division, to Distribution, 20 February 1953 ("Instructions for Positioning DA [Department of Army] Personnel at Continental Atomic Tests [Attachment to 20 February 1953 memo]") (ACHRE No. NARA-120694-A), 2.

53. White, "Desert Rock V: Reactions of Troop Participants and Forward Volunteer Officer Groups to Atomic Exercises," iii.

54. CG Sixth Army Presidio of SFran Calif, to OCAFF Ft Monroe Va, 24 April 1953 ("Reference Desert Rock msg AMCDR-CG-04237") (ACHRE No. NARA-013195-A), 1.

55. Major R. C. Morris, for the Commanding General, to Chief of Research and Development, 15 November 1955 ("Amendment to Proposed Project Regarding Blast Injury Evaluation") (ACHRE No. DOD-030895-F), 1.

56. Major Benjamin I. Hill, for the Director, Terminal Ballistics Laboratory, to Chief, Armed Forces Special Weapons Project, 13 December 1955 ("Amendment to Proposed CONARC Project Regarding Blast Injury Evaluation") (ACHRE No. DOD-030895-F), 1.

57. Colonel Irving L. Branch, for the Chief, AFSWP, to Chief of Research and Development, Department of the Army, 20 January 1956 ("Annex 'A' to 2nd Endorsement: Detailed Explanation of AFSWP Comments on Feasibility of Human Volunteer Program") (ACHRE No. DOD-030895-F), 1.

58. Ibid.

59. Colonel Irving L. Branch, for the Chief, AFSWP, to Chief of Research and Development, Department of the Army, 20 January 1956 ("Amendment to Proposed Project Regarding Blast Injury Evaluation") (ACHRE No. DOD-030895-F), 1-2.

60. National Military Establishment, Military Liaison Committee, to the Atomic Energy Commission, 24 March 1949 ("Planning for 1951 Atomic Bomb Tests") (ACHRE No. DOE-120894-C).

61. Howard Brown to Shields Warren, 20 August 1951 ("Larry Tuttle advised that he had learned from his agents in AFSWP . . .") (ACHRE No. DOE-040395-A), 1.

62. Thomas L. Shipman, Los Alamos Health Division Leader, to Shields Warren, Director, AEC Division of Biology and Medicine, 20 January 1952 ("Since Wright's return from the meeting in Washington . . .") (ACHRE No. DOE-120894-C), 2.

63. Thomas Shipman, Los Alamos Laboratory Health Division Leader, to Charles Dunham, Director, AEC Division of Biology and Medicine, 9 June 1956 ("This is a rather belated reply . . .") (ACHRE No. DOE-120894-C), 1. In response to the suggestion that Los Alamos participate in another effort, Shipman urged that the committee should

either be given some real responsibility or will at least be able to speak in a loud, strong voice against any proposed program which appears to be poorly or inadequately planned . . . or which appears to be an out and out waste of the taxpayers' money.

Ibid.

64. T. L. Shipman to Alvin Graves, 9 August 1952 ("Meeting of Biomedical Test Planning and Screening Committee") (ACHRE No. DOE-120894-C), 1. DOD records show flashblindness research at Buster-Jangle (1951), Tumbler-Snapper (1952), Upshot-Knothole (1953), Plumbbob (1953), Hardtrack II (1958), and Dominic I (1962), in Defense Nuclear Agency, 8 August 1995, "Atmospheric Test Series/Activities Matrix."

65. The topic of the bomb's effect on vision merited instruction. The 1951 HumRRO questionnaire included: "Watching an A-bomb explode five miles away can cause permanent blindness. (False)." Bordes et al., "DESERT ROCK I: A Psychological Study of Troop Reactions to an Atomic Explosion", 109. In a 1995 comment on this question, DOD noted that "[i]n the strictest sense the correct answer is 'true'. Some

permanent retinal damage will occur, but complete vision loss will not." Department of Defense, Radiation Experiments Command Center ("ACHRE Request 032795-A, HumRRO Questionnaire and Air Burst Material"), 1.

66. Colonel Victor A. Byrnes, USAF (MC), 15 March 1952 ("Operation BUSTER: Project 4.3, Flash Blindness") (ACHRE No. DOD-121594-C-4), 2.

67. The objectives were

- (a) To evaluate the visual handicap which might be expected in military personnel exposed, during daylight operations, to the flash of an atomic detonation.
- (b) To evaluate devices developed for the purpose of protecting the eye against visual impairment resulting from excessive exposure to light.

Ibid., 1.

68. J. C. Clark, Deputy Test Director, to Colonel Kenner Hertford, Director, Office of Test Operations, 5 March 1952 ("Attached is an outline of approved Project 4.5 . . .") (ACHRE No. DOE-020795-C), 1. The letter noted that at Buster-Jangle the AEC had sought and received "release of AEC responsibility" in the event of such damage and requested the same release for Tumbler-Snapper.

69. Defense Nuclear Agency, 1952 ("Operation Tumbler-Snapper") (ACHRE No. DOD-102194-C), 92.

70. Ibid.

71. Colonel Victor A. Byrnes, March 1953 ("Operation Snapper, Project 4.5: Flash Blindness, Report to the Test Director") (ACHRE No. DOD-121994-C), 12.

72. Ibid., 15.

73. Ibid. The DOD reported that it does not have the ability to retrieve the names of experimental subjects. Thus, the long-term outcome of those involved in flashblindness tests (estimated by DOD to approximate 100) is not known to the Committee.

74. Colonel Victor A. Byrnes, USAF (MC), et al., 30 November 1955 ("Operation Upshot-Knothole, Project 4.5: Ocular Effects of Thermal Radiation from Atomic Detonation--Flashblindness and Chorioretinal Burns") (ACHRE No. DOD-121994-C), 3.

75. Ibid.

76. Colonel Irving L. Branch, USAF, Acting Chief of Staff, to Assistant Secretary of Defense (Health and Medicine), 5 March 1954 ("Status of Human Volunteers in Bio-medical Experimentation") (ACHRE No. DOD-042595-A), 2.

77. Ibid., 3.

78. Colonel John Pickering; interview by John Harbert and Gil Whittemore (ACHRE), transcript of audio recording, 2 November 1994 (ACHRE Research Project Series, Interview Program File, Targeted Interview Project), 55. DOD did not locate any documents showing written consent.

79. Defense Atomic Support Agency, 15 August 1962 ("Operation Plumbbob: Technical Summary of Military Effects, Programs 1-9") (ACHRE No. DOD-100794-A), 137.

80. Defense Nuclear Agency, 1962 ("Operation Dominic I: Report of DOD Participation") (ACHRE No. DOE-082294-A).

81. John R. McGraw, Deputy Commandant, USAF, to Director, AEC, 20 March 1954 ("Examination of the *Retina* of Individuals Exposed to Recent Atomic Detonation") (ACHRE No. DOE-090994-C). The memorandum stated that it "can be assumed that all persons who viewed the actual fireball" of a recent hydrogen bomb test "without eye protection have received permanent chorio-retinal damage." The memorandum went on to recommend that "[p]opulations and observers within an approximate radius of 100 miles from ground zero should be surveyed."

82. See, for example, Byrnes, "Operation Snapper, Project 4.5," 16-17.

83. Roy B. Snapp, Secretary, AEC, minutes of meeting no. 623, 6 November 1951 (ACHRE No. DOE-033195-B), 526.

84. Defense Nuclear Agency, 23 June 1982 ("Shots Sugar and Jangle: The Final Tests of the Buster-Jangle Series") (ACHRE No. DOE-082294-C), 46.

85. John R. Hendrickson, July 1952 ("Operation Jangle, Project 6.3-1: Evaluation of Military Individual and Collective Protection Devices and Clothing") (ACHRE No. DOE-121594-C-14), 5.

86. *Ibid.*

87. *Ibid.*, 5, 20.

88. *Ibid.*, 19.

89. *Ibid.*, v.

90. U.S. Naval Radiological Defense Laboratory, 26 May 1958 ("Supplement [1] to AEC-313 [2-57] USNRDL") (ACHRE No. DOD-091494-A), 1.

91. Lieutenant Colonel Gordon L. Jacks, CmC Commanding, to TSG, DA, 12 April 1963 ("Beta Hazard Experiment Using Volunteer Military Personnel") (ACHRE No. DOD-122294-B), 1.

92. Commanding Officer and Director, U.S. Naval Radiological Defense Laboratory, to Secretary of the Navy, 26 May 1958 ("Authorization for use of radioisotopes on human volunteers, request for") (ACHRE No. DOD-091494-A), 1.

93. *Ibid.*

94. Jacks to TSG, 12 April 1963, 1.

95. "Research and Development: Use of Volunteers as Subjects of Research," AR 70-25 (1962).

96. Office of Information Services, Air Force Special Weapons Center, to Headquarters, Air Research Development Command, 27 January 1956 ("Early Cloud Penetration") (ACHRE No. DOE-122894-B), 1.

97. Air Force Systems Command, January 1963 ("History of Air Force Atomic Cloud Sampling [AFSC Historical Publication Series 61-142-1]") (ACHRE No. DOD-082294-A), 23.

98. *Ibid.*, 229.

99. Air Force Systems Command, "History of Air Force Atomic Cloud Sampling," 121.

100. E. A. Pinson [attr.], 1956 [attr.] ("Gentlemen: this morning I will discuss the following topics . . .") (ACHRE No. DOE-033195-B), 3.

101. Harold Clark, "I Flew Through an Atomic Hell," *Argosy*, December 1955, 63.

102. J. E. Banks et al., 30 April 1958 ("Operation Teapot: Manned Penetrations of Atomic Clouds, Project 2.8b") (ACHRE No. DOE-111694-A), 18.

103. The researchers found: "There appears to be no significant difference between the dose received inside and outside of the body. This indicates that the

radiation which reaches the body surface is of sufficiently high energy that it is not greatly attenuated by the body. If this is the case, then measurements made on the surface of the body are representative of the whole-body dose." Ibid.

104. James Reeves, Test Manager, to Colonel H. E. Parsons, Deputy for Military Operations, 11 April 1955 ("Radiation Dosage--Project 2.8, Operation Teapot") (ACHRE No. DOE-122894-A), 1.

105. Ibid.

106. Banks et al., "Operation Teapot, Manned Penetrations of Atomic Clouds Project 2.8b," 5.

107. Ibid.

108. One received 21.8 R and another received 21.7 R. Undated document ("On-Site Personnel Overexposure") (ACHRE No. CORP-091394-A), 6.

109. Pinson [attr.], 1956 [attr.], "Gentlemen: this morning I will discuss the following topics . . .," 3.

110. "The aircraft were B-57Bs. No special filters were installed in the cockpit pressurization system. The pilots and technical observers were given free choice of the setting of their oxygen controls." Colonel E. A. Pinson et al., 24 February 1960 ("Operation Redwing--Project 2.66a: Early Cloud Penetrations") (ACHRE DOE-122894-B), 41.

111. William Ogle, Headquarters, Task Group 7.1, to Commander Joint Task Force Seven, 8 November 1955 ("Maximum Permissible Radiation Exposure for Personnel Participating in Projects 2.66 and 11.2, Operation Redwing") (ACHRE No. DOE-013195-A), 2.

112. Pinson et al., "Operation Redwing--Project 2.66a: Early Cloud Penetrations," 5.

113. Ibid., 41.

114. Ibid., 51.

115. E. A. Pinson, interviewed by Patrick Fitzgerald (ACHRE), transcript of audio recording, 21 March 1995 (ACHRE Research Project Series, Interview Program File, Targeted Interview Project), 106.

116. Ibid., 121.

117. Office of Information Services to Headquarters, Air Research Development Command, 27 January 1956, 3.

118. Clarke, "I Flew Through an Atomic Hell," 62.

119. Interview with Pinson, 21 March 1995, 94.

120. Air Force Systems Command, "History of Air Force Atomic Cloud Sampling," 66.

121. Interview with Pinson, 21 March 1995, 15.

122. Pinson [attr.], 1956 [attr.], "Gentlemen: this morning I will discuss the following topics . . .," 8.

123. Raymond Thompson, "A Select Group of ARDC Men Collects Samples from the Mushrooms," *Baltimore Sun--Magazine Section*, 1 May 1955, 17.

124. Interview with Pinson, 21 March 1995, 38.

125. "Center Scientists Fly Through Atom Clouds," *Atomic Flyer*, 29 April 1955 (ACHRE No. DOE-122894-B), 1.

126. Office of Information Services to Headquarters, Air Research Development Command, 27 January 1956, 2.

127. Captain Paul M. Crumley et al., 11 October 1957 ("Operation Teapot--Project 2.8a: Contact Radiation Hazard Associated with Contaminated Aircraft [WT-1122]") (ACHRE No. DOE-111694-A), 9.

128. *Ibid.*, 20.

129. *Ibid.*, 21.

130. Colonel W. B. Kieffer, Deputy Commander, Air Force Special Weapons Center, to K. F. Hertford, Manager, AEC Albuquerque Operations Office, 21 March 1957 ("Recent discussion within the Air Force Special Weapons Center . . .") (ACHRE No. DOE-033195-B), 2.

131. Thomas Shipman, Los Alamos Laboratory Health Division Leader, to Al Graves, J-Division Leader, 29 March 1957 ("Decontamination of Aircraft at Tests") (ACHRE No. DOE-040595-A), 1. Thomas Shipman also argued that the new procedures could compromise the scientific projects.

Without decontamination there will be inevitable migration of contamination carrying activity to other areas where it may be very undesirable. This letter has completely overlooked the fact that people working at tests invariably have neighbors with special requirements.

*Ibid.*, 2.

132. Harold F. Plank, to Alvin C. Graves, Los Alamos Laboratory J-Division Leader, 24 April 1957 ("Col. Kieffer's Proposal for the Decontamination of Sampling Aircraft") (ACHRE No. DOE-040595-A), 2.

133. Colonel W. B. Kieffer, Deputy Commander, Air Force Special Weapons Center, to Colonel Wignall, 22 April 1957 ("Decontamination of Sampler Aircraft at Plumbbob") (ACHRE No. DOE-040595-A), 1.

134. James Reeves, Test Manager, Nevada Test Organization, to Commander, Air Force Special Weapons Center, Attention: Colonel W. B. Kieffer, Deputy Commander, 14 May 1957 ("Reference is made to your letter of March 21, 1957 . . .") (ACHRE No. DOE-032895-A), 2.

135. First Lieutenant William J. Jameson, 7 October 1957 ("Aircraft Decontamination Study") (ACHRE No. DOE-022395-B), 1.

136. The decontamination experiment had several further components. Lead vests were tested and found to provide a 6.0 percent reduction in exposure levels for air crews. In addition, the experiment tested the consequences of using a fork lift to remove air crews from contaminated planes versus the consequences of letting them climb out with a standard ladder. It concluded that the fork lift was unnecessary. *Ibid.*, 5-6.

Also at Plumbbob a project was undertaken "to measure the radiation dose, both from neutrons and gamma rays, received by an air crew delivering an MB-1 rocket." The report on the research states: "The Joint Chiefs of Staff approved the conduct of a test as a part of Operation Plumbbob in order to obtain the necessary experimental measurements." The report indicates that six studies were involved. Captain Kermit C. Kaericher and First Lieutenant James E. Banks, 11 October 1957 ("Operation PLUMBBOB--Project 2.9: Nuclear Radiation Received by Aircrews Firing the MB-1 Rocket") (ACHRE No. DOD-082294-A), 9.

137. The Advisory Committee is also aware of three more research activities involving atomic veterans. As noted, the body fluid sampling research is discussed in chapter 13. In addition, as mentioned in endnotes in this chapter, the Advisory

Committee notes experiments involving fallout shelters and the measurement of radiation exposure to air crews delivering the MB-1 rocket. The inclusion of the subjects of these three types of experiments, however, does not change our estimate that human research in connection with bomb tests involved no more than 3,000 subjects.

138. DOD records did not permit the identification of individuals who participated in particular research projects, and remaining reports do not always indicate the number of subjects. The basis for the very rough estimate of 2,000 to 3,000 research subjects in the activities reviewed by the Committee including those noted in endnote 137 is (1) 1,500 to 2,200 test-site subjects in the psychological and physiological testing, based on reports, as cited in this chapter, for three experiments and an estimated maximum of 800 for the fourth; (2) a dozen test-site subjects in the 1955 body-fluid-sampling research, as cited in the report on this research referenced in chapter 13, and an assumed comparable number for the 1956 research, for which no similar figures appear available; (3) about 100 participants in the flashblindness research, an estimate DOD provided to the Committee; (4) in the range of perhaps one dozen or two dozen participants in aircrew experiments, and perhaps a dozen to several dozen participants in decontamination experiments; (5) perhaps several dozen participants in the protective equipment research; (6) sixteen participants in shelter research; and (7) several dozen participants in the officer volunteer program. See further endnotes for citations related to particular research.

139. The permissible level of risk to which humans could be exposed in connection with bomb tests lay at the balance point of several factors. Radiation was not the only risk at issue; harm from blast and thermal burn were also possible.

140. Barton C. Hacker, *Elements of Controversy* (Berkeley: University of California Press, 1994), 118.

141. Marion W. Boyer, AEC General Manager, to Honorable Robert LeBaron, Chairman, Military Liaison Committee, 10 January 1951 ("As you know, one of the important problems . . .") (ACHRE No. DOE-040395-B-1).

142. Shipman to Warren, 15 September 1951, 1.

143. Shields Warren, Director, AEC Division of Biology and Medicine, to Carroll Tyler, Manager, Sante Fe Operations Office, 11 October 1951 ("Permissible Levels of Radiation Exposure for Test Personnel") (ACHRE No. DOE-013195-A), 1.

144. Warren's concern was not radiation risk, but injury from the blast. Shields Warren, Director, AEC Division of Biology and Medicine, to Brigadier General K. E. Fields, Director, Division of Military Application, 25 March 1952 ("Draft Staff Paper on Troop Participation in Operation Tumbler-Snapper") (ACHRE No. DOE-040395-A), 1.

145. Gordon Dean, Chairman, Atomic Energy Commission, to Brigadier General H. B. Loper, Chief, Armed Forces Special Weapons Project, 2 April 1952 ("Reference is made to letter of March 7, 1952 . . .") (ACHRE No. DOD-100694-A), 2.

146. Captain Harry H. Haight to General Fields, 21 August 1952 ("Exercise--Desert Rock IV") (ACHRE No. DOE-013195-A), 1. According to this review of Desert Rock activities, "The military importance of permitting major personnel exposures or decreases in drifting distances is not evident from the report. For the Commission to prescribe one limitation for the test personnel and allow greater latitude for the DOD would seem to be unwise and unnecessary. The Commission should strongly object to any special dispensation to the DOD which could possibly result in personnel casualties whether immediate or delayed." Ibid.

147. Colonel John C. Oakes, by direction of the Chief of Staff, to Assistant Chief of Staff, G-3, 5 June 1952 ("Indoctrination of Personnel in Atomic Warfare Operations") (ACHRE No. NARA-112594-A), 1.

148. C. D. Eddleman, Assistant Chief of Staff, G-3, 15 December 1952 ("Complete Discussion" [attachment to "Positioning of Troops at Atomic Weapons Tests"]), 1. In a 1953 memorandum to an AEC committee created to study the Nevada Test Site, Division of Biology and Medicine Director John Bugher similarly wrote:

While it may be stated with considerable certainty that no significant injury is going to result to any individual participating in test operations at the levels mentioned [3.9 R], and while it is true that the same thing would probably have to be said were the limits to be set two or three times as high, it nevertheless is true that there is no threshold to significant injury in this field, and the legal position of the Commission at once deteriorates if there is deliberate departure from . . . the accepted permissible limit.

John C. Bugher, Director, AEC Division of Biology and Medicine, to Members of the Committee to Study NPG, 8 September 1953 ("Interpretation of the Standards of Radiological Exposure") (ACHRE No. DOE-040395-A), 3-4.

149. M. W. Boyer, AEC General Manager, to Major General H. B. Loper, Chief, AFSWP, 8 January 1953 ("Reference is made to letter from Chief . . .") (ACHRE No. DOE-121594-C-8), 2.

150. Jark to Distribution, 20 February 1953, "Instructions for Positioning DA [Department of Army] Personnel at Continental Atomic Tests," 1.

151. *Ibid.*, 2-3.

152. General Cooney presented this view at a July 1951 conference on Past and Future Atomic Tests. Major Sven A. Bach, Development Branch, Research and Development Division, 12 July 1951 ("Conference at OCAFF, Fort Monroe, Virginia, re Past and Future Atomic Weapons Tests") (ACHRE No. NARA-042295-C), 1.

153. Atomic Energy Commission, minutes of meeting no. 862, 13 May 1953 (ACHRE DOE-013195-A), 2.

154. *Ibid.*

155. Chief, Bureau of Medicine and Surgery, to Chief of Naval Operations, 14 February 1952 ("Radiological Defense Training, comments and recommendations on") (ACHRE No. DOD-080295-B), 1. The proposal would have limited "the dosage of all personnel to 0.3 roentgens per week." Chief of Naval Operations to Chief, Bureau of Medicine, 23 January 1952 ("Atomic Defense Training") (ACHRE No. DOD-080295-B), 1. The proposal originated with the Pacific Fleet. See Commander, Mine Force, U.S. Pacific Fleet, to Commander in Chief, U.S. Pacific Fleet, 17 December 1951 ("Radiological Defense Training") (ACHRE No. DOD-080295-B), 1. In counseling against the use of "area contamination," BuMed solicited advice from the AEC on an isotope that "would have such characteristics that the internal hazard involved would be minimized even though amounts to be used would produce as much as 10 mr/hr, gamma radiation, three feet from the surface of the contaminated area." Chief, Bureau of Medicine and Surgery, to Director, AEC Division of Biology and Medicine, February 1952 ("Radiological Defense Training, use of radioisotopes in") (ACHRE No. DOD-080295-B), 1.

156. Shipman's comments were specifically directed at the establishment of standards for exposure to the general public. Thomas L. Shipman, Los Alamos Laboratory Health Division Leader, to Gordon Dunning, AEC Division of Biology and Medicine, 14 August 1956 ("Thanks for sending the draft concerning exposure . . .") (ACHRE No. DOE-022195-C), 1.

157. Department of Energy, *Announced United States Nuclear Tests: July 1945 Through December 1992* (Springfield, Va.: National Technical Information Service, May 1993), 65 (shot Climax in 1953). In the early days, when entirely new types of experimental weapons were being rapidly developed and tested, it was not uncommon for a particular yield to exceed estimates by 50 percent or more. In an October 1957 memorandum to AEC Division of Biology and Medicine director Charles Dunham, Shipman explained that the unpredictability of weapons effects was making biomedical experimentation increasingly difficult. "All too often preshot estimates of yields etc. are just enough in error to make the results of effects tests useless." Thomas L. Shipman, Los Alamos Laboratory Health Division Leader, to Charles Dunham, AEC Division of Biology and Medicine, 7 October 1957 ("Payne Harris is planning to attend the meeting . . .") (ACHRE No. DOE-120894-C), 2.

158. T. L. Shipman, Los Alamos Laboratory Health Division Leader, to Alvin C. Graves, J-Division Leader, 6 August 1956 ("Permissible Exposures") (ACHRE No. DOE-021095-B), 1.

159. Summary information provided by DOD in August 1995 provides a total of 216,507 participants in atmospheric tests, beginning with Trinity in 1945 and concluding with Dominic II in 1962. This tabulation shows about 1,200 instances of exposure in excess of 5 rem. The "total dose may have been measured by one or more film badges, may have been reconstructed, or may be the sum of both film badge data and reconstruction." Some individuals participated in more than one test. Defense Nuclear Agency, 8 August 1995 ("Summary of External Doses for DOD Atmospheric Nuclear Test Participants as of 24 February 1994") (ACHRE No. DOD-081195-A). See also testimony of Major General Ken Hagemann: Senate Committee on Governmental Affairs, *Human Radiation and Other Scientific Experiments: The Federal Government's Role*, 103d Cong., 2d Sess., 25 January 1994, 49-50.

Coincident with the beginning of epidemiological studies discussed in the text above, and growing congressional and public interest in the atomic vets, the Defense Department undertook an information-gathering effort called the "NTPR" (Nuclear Test Personnel Review). The NTPR includes a database, which seeks to include those who participated at tests in an effort to reconstruct the doses they received at tests, and a multivolume history of the bomb tests, which is available in many libraries.

160. Stafford L. Warren, Radiological Safety Consultant, Joint Task Force One, to Admiral Parsons, 6 January 1947 ("Hazards from Residual Radioactivity on the Crossroads Target Vessels") (ACHRE No. DOE-033195-B), 2.

161. Jonathan M. Weisgall, *Operation Crossroads: The Atomic Tests at Bikini Atoll* (Annapolis, Md.: Naval Institute Press, 1994), 210-214, 270-271. Only fragmentary records of the Medico-Legal Board remain.

162. The Naval Radiological Defense Laboratory, the new research laboratory, was established at the Hunter's Point Naval Shipyard in San Francisco, the port to which some ships contaminated in the 1946 Crossroads tests were sent.

163. George M. Lyon, Assistant Chief Medical Director for Research and Education, to Committee on Veterans Medical Problems, National Research Council, 8

December 1952 ("Medical Research Programs of the Veterans Administration") (ACHRE No. VA-052594-A), 553.

164. Ibid.

165. Ibid.

166. J. J. Fee, Commander, USN, as quoted in Weisgall, *Operation Crossroads*, 273-274.

167. Lyon to Committee on Veterans Medical Problems, 8 December 1952. 554.

168. Ibid.

169. Ibid.

170. Ibid. The report was retrieved by the VA at the time of the Advisory Committee's formation in 1994. In an April 1994 statement to the Committee, VA Secretary Jesse Brown stated his determination to find the facts related to the Confidential Division. To this end the VA reviewed significant amounts of documentary information and called on its inspector general to conduct a further review.

171. Ibid., 554.

172. Ibid., 553-554.

173. Major General Herbert B. Loper, Chief, AFSWP, to the Administrator, Veterans Administration, Attention: George M. Lyon, 8 August 1952 ("This activity has received information . . .") (ACHRE No. DOD-100694-A), 1.

174. Ibid. The specific rule or policy that provided for the record keeping referred to in this letter was not located. Thus, it is not clear whether the record keeping referred only to nuclear war-related exposures or more generally to exposures at bomb tests or other nuclear weapons-related activities as well.

175. William Middleton, VA Chief Medical Director, to the VA Administrator, 13 May 1959 ("Recommendation for Administrator's Exceptional Service Award") (ACHRE No. VA-102594-A), 1.

176. Ibid.

177. "12 January 1995 Review of Effort to Identify Involvement with Radiation Exposure of Human Subjects," Inspector General, Department of Veterans Affairs. The inspector general (IG) found that "an 'Atomic Medicine Division' was discussed as a means to deal with potential claims from veterans as a result of exposure to radiation from atomic bomb testing and to be the focal point for VA civil defense planning and support in case of nuclear war. However, claims did not materialize at that time and evidence indicates that the Division was not activated." Stephen A. Trodden, VA Inspector General, to VA Chief of Staff, 12 January 1995 ("Review of Effort to Identify Involvement with Radiation Exposure of Human Subjects") (ACHRE No. VA-011795-A), 1.

With regard to the 1952 history prepared by Dr. Lyon for the National Research Council, which has been previously quoted in the text, the IG stated that "the reference to the Atomic Medicine Division should not be taken literally as documentation that a Division was ever established." Ibid., 4.

178. In communications with Defense Department officials two alternatives were offered: (1) that the records may have been confidential medical examination data taken from participants in Crossroads, pursuant to a regulation providing for such exams; (2) that the records may have related to exposures of military scientists or technicians who worked at the Manhattan Project and were confidential because they contained weapons design or production-related data.

Navy regulations in 1947 provided that

All personnel, both military and civilian, who may be exposed to radiation or radioactive hazard, will be required to have a complete physical examination prior to commencing such duty. Special medical records separate from the normal individuals' health records will be set up and they will be classified as confidential, until declassification is permitted.

Bureau of Medicine and Surgery, 31 January 1947 ("Appendix B--Current Directives; Subject: Safety Regulations for Work in Target Vessels formerly JTF-1") (ACHRE No. DOD-020795-A), B-22. The Navy was not able to locate the records referred to.

The VA told the Committee that "the volume of classified records that are unaccounted for by the VA is too small to have constituted a defense against liability claims." Susan H. Mather, M.D., M.P.H., letter to Dan Guttman (ACHRE), 17 July 1995. Based on discussions with the VA, the basis for this statement appears to be the fact that there were more than 200,000 test participants, and the safe maintained by Dr. Lyon (in which secret documents would presumably have been kept) was relatively small. In the absence of the documents themselves, the VA's statement appears to be only one of several possible speculative alternatives. For example, the VA also explained that few claims eventuated in the period of Dr. Lyon's service; thus, the magnitude of necessary filekeeping may not have been great. Alternatively, documents kept by Dr. Lyon could have been summary documents, which referred to materials in other files. Finally, the VA's statement is also consistent with the possibility that files were kept but that their contents were deemed inadequate to constitute a defense against potential claims.

179. NEPA Medical Advisory Panel, Subcommittee IX, proceedings of 22 July 1949 (ACHRE No. DOD-121494-A-2), 17-18. The meeting is further discussed in the Introduction.

180. *Ibid.*, 18.

181. *Ibid.*

182. Department of Defense, Research and Development Board, Committee on Medical Sciences, proceedings of 23 May 1950 (ACHRE No. DOD-080694-A), 10.

183. Caldwell et al., "Leukemia Among Participants in Military Maneuvers at Nuclear Bomb Tests," *Journal of the American Medical Association* 244, no. 14 (1980).

184. Caldwell et al., "Mortality and Cancer Frequency Among Military Nuclear Test Participants, 1957 through 1959," *Journal of the American Medical Association* 250, no. 5 (1983).

185. C. D. Robinette et al., *Studies of Participants in Nuclear Weapons Test: Final Report* (Washington, D.C.: National Research Council, May 1985).

186. See U.S. General Accounting Office, *Nuclear Health and Safety: Mortality Study of Atmospheric Nuclear Test Participants Is Flawed* (Gaithersburg, Md.: GAO, 1992), 4. Helen Gelband, Health Program, Office of Technology Assessment, *Mortality of Nuclear Weapons Tests Participants* (Washington, D.C.: Office of Technology Assessment, August 1992), 4.

187. The data appear in table 1 of Clark W. Heath, Chairman, Institute of Medicine (IOM) Committee on the Mortality of Military Personnel Present at Atmospheric Tests of Nuclear Weapons, and John E. Till, Chairman, IOM Dosimetry

Working Group, to D. Michael Schaeffer, Program Manager, DNA Nuclear Test Personnel Review, 15 May 1995 ("A Review of the Dosimetry Data Available in the Nuclear Test Personnel Review [NTPR] Program: An Interim Letter Report of the Committee to Study the Mortality of Military Personnel Present at Atmospheric Tests of Nuclear Weapons") (ACHRE No. NAS-051595-A), 9.

188. Hacker, *Elements of Controversy*, 96.

189. The memo explained that the need had been foreseen, but the request for dosimeters had only been partially filled. The memo recorded that 175 "0-5 R dosimeters" were on hand at the Nevada Test Site, but a minimum of 325 were needed for an operation the size of Upshot-Knothole. Colonel Leonard F. Dow, Acting Director, Weapons Effects Tests, to Manager, AEC Santa Fe Operations, 19 February 1954 ("Rad-Safe Equipment for Nevada Proving Grounds") (ACHRE No. DOE-020795-D), 1.

190. Irving L. Branch, Chief of Staff, AFSWP, to Chief of Research and Development, OCS, Department of the Army, 20 January 1956 ("Annex 'A' to 2nd Indorsement: Detailed Explanation of AFSWP Comments on Feasibility of Human Volunteer Program") (ACHRE No. DOD-030895-F), 2.

191. Clark W. Heath and John E. Till, IOM, to D. Michael Schaeffer, DNA, "An Interim Letter Report of the Committee to Study the Mortality of Military Personnel Present at Atmospheric Tests of Nuclear Weapons," 15 May 1995.

192. K. K. Watanabe, H. K. Kang, and N. A. Dalager, "Cancer Mortality Risk Among Military Participants of a 1955 Atmospheric Nuclear Weapons Test," *American Journal of Public Health* 85 (April 1995).

193. S. Raman, G. S. Dulberg, R. A. Spasoff, and T. Scott, "Mortality Among Canadian Military Personnel Exposed to Low Dose Radiation," *Canadian Medical Association Journal* 136 (1987): 1051-1056.

194. S. C. Darby, G. M. Kendall, T. P. Fell 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* 296 (1988): 332-338.

195. *Human Radiation Experiments: The Federal Government's Role, Hearings before the Committee on Governmental Affairs, United States Senate*, 103d Cong., 2d Sess., 25 January 1994, 160.

196. DNA, "Summary of External Doses for DOD Atmospheric Nuclear Test Participants as of 24 February 1994."

197. These laws are further discussed in the Committee's recommendations. In enacting the 1984 Veterans' Dioxin and Radiation Exposure Compensation Standards Act, Congress, among other items, found

(8) The 'film badges' which were originally issued to members of the Armed Forces in connection with the atmospheric nuclear test program have previously constituted a primary source of dose information for . . . veterans filing claims . . . .

(9) These film badges often provide an incomplete measure of radiation exposure, since they were not capable of recording inhaled, ingested, or neutron doses (although the DNA currently has the capability to reconstruct individual estimates of such doses), were not issued to most of the participants in nuclear tests, often provided questionable readings

because they were shielded during the detonation, and were worn for only limited periods during and after each nuclear detonation.

(10) Standards governing the reporting of dose estimates in connection with radiation-related disability claims . . . vary among the several branches of the Armed Services, and no uniform minimum standards exist.

198. For example, Frances Brown, of Southwick, Massachusetts, told the Committee of her late husband's experience as a navigator who flew through clouds at weapons tests. Colonel Brown was assigned the duty and was given no protective clothing; he died of cancer in 1983. Ms. Brown shared with the Committee the story of years of inquiry, and her continuing inability to obtain all documents that might shed light on the duty he undertook in the service of his country.

Nancy Lynch, of Santa Barbara, California, told the Committee of her late husband's involvement in the Desert Rock exercises at Operation Teapot in 1955 and her questions regarding the dose reconstruction that was ultimately provided by the government.

Vernon Sousa, a San Francisco veteran, told of years of government "stonewalling" of his information requests. He explained that the oath of secrecy he had taken limited his own ability to discuss the tests for decades after his time in the service ended.

Charles McKay of Severna Park, Maryland, a Navy diver at Operation Crossroads, recalled that he received no briefing on radiation risks before his participation. Mr. McKay said that he received a very low dose reconstruction report from the government, which he believed to be highly inaccurate because it did not take into account diving experiences on Crossroads wrecks.

Rebecca Harrod Stringer of St. Augustine, Florida, wrote to the Committee about the Navy service of her late father in Operation Dominic I, a nuclear weapons test in the Pacific, and the fifteen years it took to obtain copies of his military and medical records.

Linda Terry of California talked of obtaining information about her late father's experiences at the Buster-Jangle tests in 1951-52. She called for full disclosure of information about the weapons tests "so that families do not have to live in the darkness" of not knowing.

Harry Lester of Albuquerque, New Mexico, testified that he was responsible for cleanup at Operation Castle and that he experienced radiation sickness as a result of his exposure. After his involvement in Castle, he was shipped to an Albuquerque hospital every six months for examinations. He told the Committee that his full records remain to be found.

Langdon Harrison of Albuquerque told the Committee about his experiences in cloud flying activities at Operations Redwing and Plumbbob. He recalled routine carelessness in the handling of the film badges of the pilots of cloud flythroughs and occasions when significantly different dose readings were recorded on film badges and personal dosimeters.

Representatives of "atomic veterans" organizations also shared with the Committee information collected in years of research on behalf of themselves and others. These included Pat Broudy of California, whose late husband died of lymphoma and had served at the occupation of Nagasaki, Bikini, and in three Nevada tests; Dr. Oscar Rosen

of Massachusetts, who participated in Crossroads; and Fred Allingham of California, whose father served in the occupation of Nagasaki and died several years later of leukemia.

199. The new rules stemmed from the development of a new howitzer. Late in the development cycle a medical hazards review found that alteration to the firing routine was needed if the weapon was to be employed without injuring U.S. soldiers. The discovery caused a long and expensive delay while biomedical studies of blast overpressure effects were done in animals and man and engineering solutions were sought to reduce the hazard. After this experience, the Army determined to conduct health hazard assessments (HHAs) early in the development of weapons and equipment, so that new material is not brought on line with unnecessarily great health and safety risk to the troops using it.

Relevant DOD directives (DODD) and Army regulations are the following: DODD 5000.1, "Defense Acquisition"; DODD 5000.2, "Defense Acquisition Management Policies and Procedures"; AR 70-1, "Army Acquisition Policy"; AR 602-1, "Human Factors Engineering Program"; AR 602-2, "Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process"; AR 385-16, "System Safety Engineering and Management"; AR 40-10, "Health Hazard Assessment Program in Support of the Army Material Acquisition Decision Process"; and AR 70-75, "Survivability of Army Personnel and Material."



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*A Not-For-Profit Veterans Service Organization Chartered by the United States Congress*

*STATEMENT OF*

**VIETNAM VETERANS OF AMERICA**

*Submitted to the*

*House Veterans Affairs' Committee*

*Subcommittee on*

*Compensation, Pension, Insurance and Memorial Affairs*

*on*

*Care and Compensation for  
Veterans Exposed to Ionizing Radiation*

*April 30, 1996*

## INTRODUCTION

Mr. Chairman and members of the Committee, Vietnam Veterans of America (VVA) appreciates the opportunity to present its views on care and compensation for veterans exposed to ionizing radiation.

Mr. Chairman, this has been a topic of concern for VVA for a number of years, though it affects none of our members directly. Vietnam Veterans of America pledged at our founding convention and continues to reaffirm the principle that "never again shall one generation of veterans abandon another." It is apparent that the difficulties the "Atomic veterans" experience in getting just compensation and treatment for their difficult-to-prove service-connected disabilities are comparable to those faced by Vietnam veterans exposed to Agent Orange. To this end, we continue to offer our support, knowledge and advocacy to the needs of these fellow veterans.

Radiation-exposed veterans as a population were nearly decimated before the first disability compensation bill was passed on their behalf. Included among the small number of surviving "atomic veterans" are a few involved in the bombing of Japan in 1945 as POWs and combat forces, and troops later involved in a variety of nuclear tests from 1946 through 1962, mostly conducted by our own government. There is a story of terrible illness and evasion of responsibility.

In recent years, however, Congress has accepted limited measures of responsibility for providing care and compensation. These measures have helped some and ignored others, and most of the widows remain uncompensated. To date, fewer than 500 claims have been filed under laws awarding presumptive compensation, mostly to widows. Veterans who are compensated are terminally ill, and the total cost is therefore not great. If the diseases covered under PL 98-542 were added to the list of those treated as presumptive, the Defense Nuclear Agency (DNA) and its contractors could be freed of providing costly dose reconstructions.

VVA recommends that all radiation victims be compensated presumptively for a common list of conditions, regardless of site of exposure and without trying to reconstruct dose levels. The eleven additional radiation risk activities reported by the Veterans Affairs Committee on Environmental Hazards (August 1993) should be included in current and future legislation regarding atomic veterans, without time constraints.

VA should no longer rely upon radioepidemiological tables in determining service-connected benefits. VA claims awards should be retroactive to the date of their first filing, including those currently receiving benefits, without necessity of refiling.

Likewise, all classified medical and service records of atomic veterans should be declassified immediately. The day has long passed since their shroud of secrecy served any legitimate purpose. Presence onsite at any nuclear test or other proximity to ionizing radiation must be presumed in the absence of contrary evidence, just as service in Vietnam is accepted as evidence of exposure to Agent Orange.

VVA also supports registry of birth defects of the children of atomic veterans. Further such information must be made available for independent, non-governmental study. Compensation and treatment as needed must be made available. A just formulation for compensation of survivors of atomic veterans must also be worked out.

Mr. Chairman, this concludes our testimony.

## WRITTEN COMMITTEE QUESTIONS AND THEIR RESPONSES

## DEPARTMENT OF VETERANS AFFAIRS

RESPONSES TO POST-HEARING QUESTIONS  
CONCERNING THE APRIL 30, 1996  
HEARING ON IONIZING RADIATIONFROM THE  
HONORABLE TERRY EVERETT, CHAIRMAN  
SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE  
AND MEMORIAL AFFAIRS  
HOUSE COMMITTEE ON VETERANS' AFFAIRS

The DNA estimates about 405,000 veterans took part in nuclear test programs and the occupation of Nagasaki and Hiroshima.

**Question 1:** How many of those veterans are now on the VA's Ionizing Radiation Registry?

**Answer:** VA has been performing a physical examination on each veteran who reported an exposure to ionizing radiation while participating in the atmospheric nuclear weapons testing program, or while serving with occupational forces, or as a prisoner of war in Hiroshima or Nagasaki, Japan. Under our policy, no one reporting any such radiation exposure is denied an examination. As of May 1, 1996, the Ionizing Radiation Registry contained radiation examination code sheets on 21,543 veterans who reported service-connected radiation exposure. The exact number of these 21,543 veterans who are also listed on the DNA Nuclear Test Personnel Review (NTPR) database is somewhat uncertain. Each veteran listed on these radiation examination code sheets was identified by name and Social Security number (SSN). A military service number (MSN) was also listed for approximately two-thirds of these veterans. In contrast, all individuals on the DNA/NTPR database were identified by name and MSN; however, the SSN's were listed for only one-third, approximately. Because of this existing idiosyncrasy between the two databases, identification of veterans who were listed on both databases was not straightforward. Using all available data (name, SSN, MSN, date of birth), it was estimated that approximately one-fourth of the veterans on the Ionizing Radiation Registry could be identified from the DNA/NTPR database.

**Question 2:** What is VA doing to analyze the health of the members of the Ionizing Radiation Registry?

The testimony cited a lack of knowledge about the effects of chronic low level exposure to radiation. With 405,000 veterans exposed to some levels of radiation, you could say that this is a relatively veteran-unique area of study. In recent years, VA's R&D budget has received over \$250 million per year from Congress and probably double that from other contractual sources.

How much of that is devoted to research on low level radiation exposure?

**Answer:** According to the DNA, many test participants received no measurable dose of ionizing radiation and less than 1 percent of all military participants received a cumulative dose that met or exceeded the Federal guideline for occupational exposure of 5 rem in 12 consecutive months. A total of 1,750 nuclear test participants were identified as having received a cumulative gamma radiation dose of 5 rem or higher. These veterans were advised by the DNA to have a radiation examination at a VA medical facility. VA's Environmental Epidemiology Service is studying the mortality and morbidity experience of these veterans with the highest exposures, with particular emphasis on the 1,140 veterans who received a cumulative dose of 5 rem or more while participating in a single nuclear test series. The study is expected to be completed in six months. In addition, the Environmental Epidemiology Service examined the cancer mortality risk of 8,554 U.S.

Navy veterans who participated in an 1958 atmospheric nuclear test in the Pacific (Operation Hardtack I) and compared the results with those of 14,625 U.S. Navy veterans who were in service at that time but did not participate in a nuclear test. The study was completed and published in the American Journal of Public Health in April 1995. [Watanabe KK, Kang HK, Dalager NA. Cancer mortality risk among military participants of a 1958 atmospheric nuclear weapon test. Am J Public Health 1995;85:523-527.]

The VA's Environmental Epidemiology Service has spent approximately \$72,000 per year to support the Hardtack I study and a study of veterans in the VA's Ionizing Radiation Registry who were exposed to greater than 5 rem of gamma radiation.

Also, the VA is supporting a Medical Follow Up Agency study of Operation Crossroads personnel at a cost of about \$250,000 per year.

In addition the VA's Office of Research and Development has spent approximately \$1,800,000 per year to support investigator-initiated research projects possibly relevant to low-level ionizing radiation.

**DEPARTMENT OF VETERANS AFFAIRS**  
**RESPONSES TO POST-HEARING QUESTIONS**  
**CONCERNING THE APRIL 30, 1996**  
**HEARING ON IONIZING RADIATION**  
  
**FROM THE**  
**HONORABLE G.V. (SONNY) MONTGOMERY**  
**RANKING MEMBER**  
**HOUSE COMMITTEE ON VETERANS' AFFAIRS**

**Question 1:** Has the Department of Veterans Affairs done any analysis of the reasons atomic veterans have been denied VA compensation benefits?

Please furnish the results of any analysis (along with supporting documentation).

**Answer:** VA has not done a formal analysis of the reasons atomic veterans have been denied VA compensation benefits. The reasons and bases for decisions on any individual's claim are contained in that individual's claims folder. Therefore, only through the identification of the atomic veteran's claims file and subsequent review of that file will we be able to provide information and documentation concerning the claim.

**Question 2:** What are the most important subjects the Interagency Working Group is examining? When do you expect to report on the Group's accomplishments?

**Answer:** The VA Human Radiation Interagency Working Group is responsible for developing the Administration's response to recommendation 6 of the Presidential Advisory Committee on Human Radiation Experimentation's (ACHRE) report dated October 3, 1995.

This recommendation suggests that VA, "along with Congress, give serious consideration to reviewing and updating epidemiological tables that are relied upon to determine whether relief is appropriate for veterans who participated in atomic testing so that all cancers or other diseases for which there is reasonable probability of causation by radiation exposure during active military service are clearly and unequivocally covered by the statutes." This recommendation further suggests that VA "review whether existing laws governing the compensation of atomic veterans are now administered in ways that best balance allocation of resources between financial compensation to eligible atomic veterans and administrative costs, including the costs and scientific credibility of dose reconstruction."

The VA Working Group anticipates completing its analysis of recommendation 6 later this summer.

DEPARTMENT OF VETERANS AFFAIRS

RESPONSES TO POST-HEARING QUESTIONS  
CONCERNING THE APRIL 30, 1996  
HEARING ON IONIZING RADIATION

FROM THE  
HONORABLE LANE EVANS, RANKING MEMBER  
SUBCOMMITTEE ON COMPENSATION, PENSION, INSURANCE  
AND MEMORIAL AFFAIRS  
HOUSE COMMITTEE ON VETERANS' AFFAIRS

**Question 1:** Is there a VACEH Report to the Secretary reporting on additional radiation risk activities pursuant to 102-578?

**Answer:** Yes. The VACEH issued the report in August 1993.

**Question 1a:** If so, has the Secretary reported to Congress as required by 102-578.

**Answer:** Yes. The Secretary reported to Congress on May 26, 1994, and transmitted at the same time a copy of the VACEH's report.

**Question 2:** What, if any, documents would comprise a "certified list" as identified in 98-542 for 102-578 and 100-321?

**Answer:** We are uncertain what this question refers to. We have been unable to find any reference in Public Law 98-542 to a "certified list."

**Question 3.** What, if any, documents or materials are there relating to dose reconstruction done by SAIC or other contractors and the process used by the Secretary in evaluating the methodology used by SAIC in doing dose reconstruction?

**Answer:** Generally, VA does not question or evaluate the methodology used by the Defense Nuclear Agency or its contractors in doing dose reconstructions. However, there is a mechanism in place to reconcile any differences in dose estimates. When it is necessary to reconcile a material difference between an estimate of dose submitted by or on behalf of a claimant and dose data derived from official military records, the estimates and supporting documentation are referred to an independent expert, selected by the Director of the National Institutes of Health, who prepares a separate radiation dose estimate for consideration of a claim. Any records relating to dose estimates done by an independent expert are case-specific and maintained in the individual's claims records, which are protected under the Privacy Act.

**Question 4:** Is there written documentation or criteria used for denying claims of veterans based on dose reconstruction? If so, please make them available for the record.

**Answer:** The only documents and criteria pertinent to this question are those governing the adjudication of such claims generally, as found in 38 CFR 3.311 and our procedural directives. Copies are included.

**Question 5:** Are there records which reflect the total number of claims denied and granted when dose reconstruction was done?

**Answer:** Attached is a statistical summary that we have on cases involving radiation claims. It is impossible to determine from our data base in which cases a dose

reconstruction was done. That could be determined only from a manual review of the over 18,000 claims folders.

**Question 6:** Are there documents which show the number of claims granted and denied under (a) 98-542, (b) 100-321 and (c) 102-578?

**Answer:** (a) We have no documents detailing a separate count of these cases, and the data cannot be obtained from our electronic data bases. The only documents from which the data could be obtained would be VA rating decisions. To discover those would require a manual review of over 18,000 claims folders. We believe that the number of grants would be quite small, probably fewer than 50; however, we have no statistics to substantiate this.

(b) & (c) Both Public Law 100-321 and Public Law 102-578 legislated presumptive radiogenic conditions. The original 13 conditions came from Public Law 100-321, and Public Law 102-578 added cancer of the salivary glands and cancer of the urinary tract. The statistical summary referred to in our response to question 5 shows the number of grants for all presumptive radiogenic diseases as 470. We recently did an independent count from our data bases of grants for urinary tract cancer and found that there were 16. Our data bases do not maintain separate data on disallowances under the radiation presumptive provisions of law.

To discover other documents would require a manual review of over 18,000 claims folders to extract information from rating decisions.

**Question 7:** Are there documents showing the determinations made by the Secretary where a veteran claimed he was involved in a radiation risk activity as defined by 100-321, but could not produce any evidence of being at the specific location and the government had no evidence of the veteran being at the radiation risk activity?

**Answer:** Such documents would be maintained in the over 18,000 claims folders of those who have filed claims for compensation based on exposure to ionizing radiation. We would be happy to review any identifiable cases in which these circumstances are alleged to exist.

**Question 8:** Are there documents which show any granting of compensation to a veteran who was exposed to ionizing radiation and claims a disease other than cancer at the radiation risk activities designated in 100-321?

**Answer:** Such documents would be maintained in the over 18,000 claims folders of those who have filed claims for compensation based on exposure to ionizing radiation.

**Question 9:** Are there any documents which indicate whether veterans (or survivors of veterans) exposed to ionizing radiation who were denied compensation under 98-542 or prior to the passage of 98-542, were notified by the Secretary to reapply for compensation with the passage of 100-321 and 102-578 and the addition of additional cancers to the presumptive list?

**Answer:** No specific outreach program was conducted at the time Public Laws 100-321 or 102-578 were passed. However, the Secretary's designee, the Director of the Compensation and Pension Service, instructed all regional offices to review all claims for benefits based on radiation exposure denied prior to approval of the new criteria established by these public laws. These reviews consisted of development for additional evidence in support of these claims from the individual claimant or service department as well as notification to the claimant of the outcome of our review.

**Question 10:** Are there any documents relating to any studies presently being done or being planned by the Secretary or any organization or group at the Secretary's direction to study the effects of ionizing radiation on the children, grandchildren and great grandchildren of veterans exposed to ionizing radiation?

**Answer:** No. The Secretary of Veterans Affairs, in accordance with Public Law 103-446, Section 508, requested the Medical Follow-up Agency of the Institute of Medicine (IOM) to establish a committee to review the available data and scientific literature and to prepare a report on the feasibility of studying veterans exposed to ionizing radiation and the risk of adverse health effects in their spouses, children, and grandchildren. The committee was established in January 1995, and it completed the feasibility study report in June 1995. The committee concluded that an epidemiologic study to assess an increased risk of adverse reproductive outcomes in spouses and of adverse health effects in children and grandchildren of Atomic Veterans is not feasible because of, among other concerns, insurmountable difficulties in finding and contacting a sufficient number of study subjects, in establishing an accurate measure of the dosage received by each veteran, in detecting the extremely small potential risk at low dosage, and in identifying and reliably documenting reproductive outcomes over a 50-year interval. In consideration of the IOM committee assessment, the Secretary has not directed any study to investigate the effects of ionizing radiation on children, grandchildren, and great grandchildren of veterans exposed to ionizing radiation.

**Question 10a:** Is there a registry of such children?

**Answer:** VA is not aware of any such registry.

**Question 11:** Are there any documents showing the criteria used to grant or deny benefits to veterans exposed to ionizing radiation?

**Answer:** Copies of pertinent regulations (38 CFR 3.311) and procedural directives are attached.

**Question 12:** Are there any documents which show that the Secretary provided the atomic veteran the "benefit of the doubt" in determining the approximately 91% of denied claims?

**Answer:** The regulation governing reasonable doubt (38 CFR 3.102) applies to any claim in which all procurable data create an approximate balance of positive and negative evidence. Documents specific to individual "atomic veteran" cases could be obtained only upon review of the over 18,000 claims folders.

**Question 13:** In your statement before the Subcommittee on Compensation, Pension, Insurance and Memorial Affairs, House of Representatives, April 30, 1996, you state on page two, the description of VA's dependence on DNA for dose information as well as VA's responsibility for preparing dose estimates from any available official military records.

**Question 13a:** Who does the dose reconstruction in this case?

**Answer:** The dose estimate is provided by staff in the office of the Chief Public Health and Environmental Hazards Officer, Veterans Health Administration, with assistance of other individuals when appropriate, such as the Chief, Technology Division, Radiology Service, the Director of the VA National Health Physics Program, and the Chief of Radiation Oncology at a VA medical center.

**Question 13b:** "VA obtains a separate estimate from an independent expert selected by the Director of National Institutes of Health." Does this mean an independent expert agreeable to the claimant as well?

**Answer:** Public Law 98-542 provides that reconciliation of conflicting radiation dose estimates will be accomplished by an independent expert selected by the Director of the National Institutes of Health. Neither the public law, nor the implementing VA regulations (38 C.F.R. 311(a)(3)), provide for either the VA or the claimant to veto the NIH Director's selection of the independent expert.

**Question 13c:** Although veterans have shown in their many claims and denials that it is "at least as likely as not" that his claimed disease resulted from radiation exposure, this practice is not followed in many cases. Why is this edict not followed, although mandated in section 3.102 CFR, a law in effect at all times since the Civil War?

**Answer:** We are unaware that any of the denied radiation claims contain evidence that contradicts the determination that a claimed condition is at least as likely as not to be the result of exposure to ionizing radiation. To determine this would require review of over 18,000 individual records.

**Question 13d:** Until recently we have been told there is no way to distinguish the numbers of claims awarded out of the 18,000 applied for. Within the past few days we received a fax from Kathy Collier, Staff Consultant, Compensation and Pension Service, to the effect that a special request "to our data information and systems staff", which would take about a week, could produce the numbers; however, "we believe that it currently would be fewer than 50." Why hasn't this information been furnished over the years, especially those requested by Congress? As of January 1, 1996, 463 claims have been awarded out of 18,515 adjudicated under the presumptive laws. The contractors for the DNA NTPR (SAIC) charge at least \$3,000 per dose reconstruction. DNA costs for the "less than 50" claims is \$13,598,939. The 463 allowed under the presumptive laws does not require dose reconstruction, therefore, because the \$13,598,939 was not reduced by the cost of reconstruction for those presumptive awards, are we to assume that this entire amount was used to do dose reconstructions for the "less than 50"?

**Answer:** The fax referred to in this question relates to a request we received from Mrs. Pat Broudy of the National Association of Atomic Veterans. Mrs. Broudy requested very specific information and imposed the restriction that it be furnished within a time frame of hours. Because a response could not be provided within Mrs. Broudy's established time frame she was advised that it was unavailable.

Our data bases were established to collect the number of grants of service connection for presumptive radiogenic conditions as well as the total number of veterans records in which radiation claims have been made. These data bases do not collect information that would allow us to determine the exact number of cases in which service connection has been allowed under 38 CFR 3.311. Although as stated the number of grants for presumptive service connection for radiogenic diseases is maintained, this information is not broken down by live and death claims. To do that requires a complex and time consuming project. We do not routinely generate statistics that differentiate between live and death claims.

The remainder of this question is deferred to the Defense Nuclear Agency for response since budget authority for dose reconstructions falls under their purview.

Attachments to Evans Question 4 & 11

1. **Attachment A:** Copy of pertinent pages from CFR 3.311--Claims based on exposure to ionizing radiation
2. **Attachment B:** Copy of pertinent pages from CFR 3.309--Disease subject to presumptive service connection
3. **Attachment C:** Copy of pertinent pages from M21-1, Part III
4. **Attachment D:** Copy of pertinent pages from M21-1, Part VI

Attachment to Evans Question 5 & 6

1. **Attachment E:** Radiation Statistics

1. **Attachment A:** Copy of pertinent pages from CFR 3.311--Claims based on exposure to ionizing radiation

§3.311 Claims based on exposure to ionizing radiation.

(a) *Determinations of exposure and dose:*

(1) *Dose assessment.* In all claims in which it is established that a radiogenic disease first became manifest after service and was not manifest to a compensable degree within any applicable presumptive period as specified in §3.307 or §3.309, and it is contended the disease is a result of exposure to ionizing radiation in service, an assessment will be made as to the size and nature of the radiation dose or doses. When dose estimates provided pursuant to paragraph (a)(2) of this section are reported as a range of doses to which a veteran may have been exposed, exposure at the highest level of the dose range reported will be presumed. (Authority: 38 U.S.C. 501(a))

(2) *Request for dose information.* Where necessary pursuant to paragraph (a)(1) of this section, dose information will be requested as follows:

(i) *Atmospheric nuclear weapons test participation claims.* In claims based upon participation in atmospheric nuclear testing, dose data will in all cases be requested from the appropriate office of the Department of Defense.

(ii) *Hiroshima and Nagasaki occupation claims.* In all claims based on participation in the American occupation of Hiroshima or Nagasaki, Japan, prior to July 1, 1946, dose data will be requested from the Department of Defense.

(iii) *Other exposure claims.* In all other claims involving radiation exposure, a request will be made for any available records concerning the veteran's exposure to radiation. These records normally include but may not be limited to the veteran's Record of Occupational Exposure to Ionizing Radiation (DD Form 1141), if maintained, service medical records, and other records which may contain information pertaining to the veteran's radiation dose in service. All such records will be forwarded to the Under Secretary for Health, who will be responsible for preparation of a dose estimate, to the extent feasible, based on available methodologies.

(3) *Referral to independent expert.* When necessary to reconcile a material difference between an estimate of dose, from a credible source, submitted by or on behalf of a claimant, and dose data derived from official military records, the estimates and supporting documentation shall be referred to an independent expert, selected by the Director of the National Institutes of Health, who shall prepare a separate radiation dose estimate for consideration in adjudication of the claim. For purposes of this paragraph:

(i) The difference between the claimant's estimate and dose data derived from official military records shall ordinarily be considered material if one estimate is at least double the other estimate.

(ii) A dose estimate shall be considered from a "credible source" if prepared by a person or persons certified by an appropriate professional body in the

field of health physics, nuclear medicine or radiology and if based on analysis of the facts and circumstances of the particular claim.

(4) *Exposure.* In cases described in paragraph (a)(2)(i) and (ii) of this section:

(i) If military records do not establish presence at or absence from a site at which exposure to radiation is claimed to have occurred, the veteran's presence at the site will be conceded.

(ii) Neither the veteran nor the veteran's survivors may be required to produce evidence substantiating exposure if the information in the veteran's service records or other records maintained by the Department of Defense is consistent with the claim that the veteran was present where and when the claimed exposure occurred.

(b) *Initial review of claims.*

(1) When it is determined:

(i) A veteran was exposed to ionizing radiation as a result of participation in the atmospheric testing of nuclear weapons, the occupation of Hiroshima or Nagasaki, Japan from September 1945 until July 1946 or other activities as claimed;

(ii) The veteran subsequently developed a radiogenic disease; and

(iii) Such disease first became manifest within the period specified in paragraph (b)(5) of this section; before its adjudication the claim will be referred to the Under Secretary for Benefits for further consideration in accordance with paragraph (c) of this section. If any of the foregoing 3 requirements has not been met, it shall not be determined that a disease has resulted from exposure to ionizing radiation under such circumstances.

(2) For purposes of this section the term "radiogenic disease" means a disease that may be induced by ionizing radiation and shall include the following:

- (i) All forms of leukemia except chronic lymphatic (lymphocytic) leukemia;
- (ii) Thyroid cancer;
- (iii) Breast cancer;
- (iv) Lung cancer;
- (v) Bone cancer;
- (vi) Liver cancer;
- (vii) Skin cancer;
- (viii) Esophageal cancer;
- (ix) Stomach cancer;
- (x) Colon cancer;
- (xi) Pancreatic cancer;

- (xii) Kidney cancer;
- (xiii) Urinary bladder cancer;
- (xiv) Salivary gland cancer;
- (xv) Multiple myeloma;
- (xvi) Posterior subcapsular cataracts;
- (xvii) Non-malignant thyroid nodular disease;
- (xviii) Ovarian cancer;
- (xix) Parathyroid adenoma;
- (xx) Tumors of the brain and central nervous system;
- (xxi) Cancer of the rectum; and
- (xxii) Lymphomas other than Hodgkin's disease.

(Authority: 38 U.S.C. 501(a))

(3) For purposes of paragraphs (a)(1) and (b)(1) of this section, "radiogenic disease" shall not include polycythemia vera.

(4) If a claim is based on a disease other than one of those listed in paragraphs (b)(2) or (b)(3) of this section, VA shall nevertheless consider the claim under the provisions of this section provided that the claimant has cited or submitted competent scientific or medical evidence that the claimed condition is a radiogenic disease.

(5) For the purposes of paragraph (b)(1) of this section:

(i) Bone cancer must become manifest within 30 years after exposure;

(ii) Leukemia may become manifest at any time after exposure;

(iii) Posterior subcapsular cataracts must become manifest 6 months or more after exposure; and

(iv) Other diseases specified in paragraph (b)(2) of this section must become manifest 5 years or more after exposure. (Authority: 38 U.S.C. 501(a); Pub. L. 98-542)

(c) *Review by Under Secretary for Benefits.*

(1) When a claim is forwarded for review pursuant to paragraph (b)(1) of this section, the Under Secretary for Benefits shall consider the claim with reference to the factors specified in paragraph (e) of this section and may request an advisory medical opinion from the Under Secretary for Health.

(i) If after such consideration the Under Secretary for Benefits is convinced sound scientific and medical evidence supports the conclusion it is at least as likely as not the veteran's disease resulted from exposure to radiation in service, the Under Secretary for Benefits shall so inform the regional office of jurisdiction in writing. The Under Secretary for Benefits shall set forth the rationale for this

conclusion, including an evaluation of the claim under the applicable factors specified in paragraph (e) of this section.

(ii) If the Under Secretary for Benefits determines there is no reasonable possibility that the veteran's disease resulted from radiation exposure in service the Under Secretary for Benefits shall so inform the regional office of jurisdiction in writing, setting forth the rationale for this conclusion.

(2) If the Under Secretary for Benefits, after considering any opinion of the Under Secretary for Health, is unable to conclude whether it is at least as likely as not or that there is no reasonable possibility, the veteran's disease resulted from radiation exposure in service, the Under Secretary for Benefits shall refer the matter to an outside consultant in accordance with paragraph (d) of this section.

(3) For purposes of paragraph (c)(1) of this section, "sound scientific evidence" means observations, findings, or conclusions which are statistically and epidemiologically valid, are statistically significant, are capable of replication, and withstand peer review, and "sound medical evidence" means observations, findings, or conclusions which are consistent with current medical knowledge and are so reasonable and logical as to serve as the basis of management of a medical condition.

(d) *Referral to outside consultants.*

(1) Referrals pursuant to paragraph (c) of this section shall be to consultants selected by the Under Secretary for Health from outside VA, upon the recommendation of the Director of the National Cancer Institute. The consultant will be asked to evaluate the claim and provide an opinion as to the likelihood the disease is a result of exposure as claimed.

(2) The request for opinion shall be in writing and shall include a description of:

- (i) The disease, including the specific cell type and stage, if known, and when the disease first became manifest;
- (ii) The circumstances, including date, of the veteran's exposure;
- (iii) The veteran's age, gender, and pertinent family history;
- (iv) The veteran's history of exposure to known carcinogens, occupationally or otherwise;
- (v) Evidence of any other effects radiation exposure may have had on the veteran; and
- (vi) Any other information relevant to determination of causation of the veteran's disease.

The Under Secretary for Benefits shall forward, with the request, copies of pertinent medical records and, where available, dose assessments from official sources, from credible sources as defined in paragraph (a)(3)(ii) of this section, and from an independent expert pursuant to paragraph (a)(3) of this section.

(3) The consultant shall evaluate the claim under the factors specified in paragraph (e) of this section and respond in writing, stating whether it is either likely, unlikely, or approximately as likely as not the veteran's disease resulted from exposure to ionizing radiation in service. The response shall set forth the rationale for the consultant's conclusion, including the consultant's evaluation under the applicable factors specified in paragraph (e) of this section. The Under Secretary for Benefits shall review the consultant's response and transmit it with any comments to the regional office of jurisdiction for use in adjudication of the claim.

(e) *Factors for consideration.* Factors to be considered in determining whether a veteran's disease resulted from exposure to ionizing radiation in service include:

(1) The probable dose, in terms of dose type, rate and duration as a factor in inducing the disease, taking into account any known limitations in the dosimetry devices employed in its measurement or the methodologies employed in its estimation;

(2) The relative sensitivity of the involved tissue to induction, by ionizing radiation, of the specific pathology;

(3) The veteran's gender and pertinent family history;

(4) The veteran's age at time of exposure;

(5) The time-lapse between exposure and onset of the disease; and

(6) The extent to which exposure to radiation, or other carcinogens, outside of service may have contributed to development of the disease.

(f) *Adjudication of claim.* The determination of service connection will be made under the generally applicable provisions of this part, giving due consideration to all evidence of record, including any opinion provided by the Under Secretary for Health or an outside consultant, and to the evaluations published pursuant to §1.17 of this title. With regard to any issue material to consideration of a claim, the provisions of §3.102 of this title apply.

(g) *Willful misconduct and supervening cause.* In no case will service connection be established if the disease is due to the veteran's own willful misconduct, or if there is affirmative evidence to establish that a supervening, nonservice-related condition or event is more likely the cause of the disease.

[50 FR 34458, Aug. 26, 1985, as amended at 54 FR 42803, Oct. 18, 1989; 58 FR 16358, Mar. 26, 1993; redesignated at 59 FR 5107, Feb. 3, 1994; 59 FR 45975, Sept. 6, 1994; 60 FR 9628, Feb. 21, 1995; 60 FR 53277, Oct. 13, 1995]

**Supplement *Highlights* references:** 7(1), 10(1), 13(1), 14(7), 18(4).

2. **Attachment B:** Copy of pertinent pages from CFR 3.309--Disease subject to presumptive service connection

3.309-3

§3.309—Disease subject to presumptive service connection

3.309-3

Helminthiasis.  
 Malnutrition (including optic atrophy associated with malnutrition).  
 Pellagra.  
 Any other nutritional deficiency.  
 Psychosis.  
 Any of the anxiety states.  
 Dysthymic disorder (or depressive neurosis).  
 Organic residuals of frostbite, if it is determined that the veteran was interned in climatic conditions consistent with the occurrence of frostbite.  
 Post-traumatic osteoarthritis.  
 Irritable bowel syndrome.  
 Peptic ulcer disease.  
 Peripheral neuropathy except where directly related to infectious causes.

**Note:** For purposes of this section, the term *beriberi heart disease* includes ischemic heart disease in a former prisoner of war who had experienced localized edema during captivity. (Authority: 38 U.S.C. 1112)

(d) *Diseases specific to radiation-exposed veterans.*

(1) The diseases listed in paragraph (d)(2) of this section shall be service-connected if they become manifest in a radiation-exposed veteran as defined in paragraph (d)(3) of this section, provided the rebuttable presumption provisions of §3.307 of this part are also satisfied.

(2) The diseases referred to in paragraph (d)(1) of this section are the following:

- (i) Leukemia (other than chronic lymphocytic leukemia).
- (ii) Cancer of the thyroid.
- (iii) Cancer of the breast.
- (iv) Cancer of the pharynx.
- (v) Cancer of the esophagus.
- (vi) Cancer of the stomach.
- (vii) Cancer of the small intestine.
- (viii) Cancer of the pancreas.
- (ix) Multiple myeloma.
- (x) Lymphomas (except Hodgkin's disease).
- (xi) Cancer of the bile ducts.
- (xii) Cancer of the gall bladder.
- (xiii) Primary liver cancer (except if cirrhosis or hepatitis B is indicated).
- (xiv) Cancer of the salivary gland.
- (xv) Cancer of the urinary tract.

**Note:** For the purposes of this section, the term *urinary tract* means the kidneys, renal pelves, ureters, urinary bladder, and urethra.

(3) For purposes of this section:

3.309-4

§3.309—Disease subject to presumptive service connection

3.309-4

(i) The term *radiation-exposed veteran* means either a veteran who, while serving on active duty, or an individual who while a member of a reserve component of the Armed Forces during a period of active duty for training or inactive duty training, participated in a radiation-risk activity.

(ii) The term *radiation-risk activity* means:

(A) Onsite participation in a test involving the atmospheric detonation of a nuclear device.

(B) 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.

(C) 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.

(iii) The term *atmospheric detonation* includes underwater nuclear detonations.

(iv) The term *onsite participation* means:

(A) During the official operational period of an atmospheric nuclear test, presence at the test site, or performance of official military duties in connection with ships, aircraft or other equipment used in direct support of the nuclear test.

(B) During the six month period following the official operational period of an atmospheric nuclear test, presence at the test site or other test staging area to perform official military duties in connection with completion of projects related to the nuclear test including decontamination of equipment used during the nuclear test.

(C) Service as a member of the garrison or maintenance forces on Eniwetok during the periods June 21, 1951, through July 1, 1952, August 7, 1956, through August 7, 1957, or November 1, 1958, through April 30, 1959.

(D) Assignment to official military duties at Naval Shipyards involving the decontamination of ships that participated in Operation Crossroads.

(v) For tests conducted by the United States, the term *operational period* means:

(A) For Operation *TRINITY* the period July 16, 1945 through August 6, 1945.

(B) For Operation *CROSSROADS* the period July 1, 1946 through August 31, 1946.

(C) For Operation *SANDSTONE* the period April 15, 1948 through May 20, 1948.

(D) For Operation *RANGER* the period January 27, 1951 through February 6, 1951.

(E) For Operation *GREENHOUSE* the period April 8, 1951 through June 20, 1951.

(F) For Operation *BUSTER-JANGLE* the period October 22, 1951 through December 20, 1951

- (G) For Operation *TUMBLER-SNAPPER* the period April 1, 1952 through June 20, 1952.
- (H) For Operation *IVY* the period November 1, 1952 through December 31, 1952.
- (I) For Operation *UPSHOT-KNOTHOLE* the period March 17, 1953 through June 20, 1953.
- (J) For Operation *CASTLE* the period March 1, 1954 through May 31, 1954.
- (K) For Operation *TEAPOT* the period February 18, 1955 through June 10, 1955.
- (L) For Operation *WIGWAM* the period May 14, 1955 through May 15, 1955.
- (M) For Operation *REDWING* the period May 5, 1956 through August 6, 1956.
- (N) For Operation *PLUMBBOB* the period May 28, 1957 through October 22, 1957.
- (O) For Operation *HARDTACK I* the period April 28, 1958 through October 31, 1958.
- (P) For Operation *ARGUS* the period August 27, 1958 through September 10, 1958.
- (Q) For Operation *HARDTACK II* the period September 19, 1958 through October 31, 1958.
- (R) For Operation *DOMINIC I* the period April 25, 1962 through December 31, 1962.
- (S) For Operation *DOMINIC II/ PLOWSHARE* the period July 6, 1962 through August 15, 1962.

(vi) 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.

(vii) 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 paragraph (d)(4)(vii)(A) of this section although not interned within those areas, or

(C) Served immediately following internment in a capacity which satisfies the definition in paragraph (d)(4)(vi) of this section, or

(D) Were repatriated through the port of Nagasaki.  
(Authority: 38 U.S.C. 1110, 1112, 1131)

(e) *Disease associated with exposure to certain herbicide agents.* If a veteran was exposed to an herbicide agent during active military, naval, or air service, the following diseases shall be service-connected if the requirements of §3.307(a)(6) are met even

3. **Attachment C:** Copy of pertinent pages from M21-1, Part III

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sources may include, but are not limited to, service personnel records, medical records, lay statements and any other source identified by the claimant.

(a) Do not request dose estimates unless consideration is to be given under 38 CFR 3.311.

(b) Development letters to DNA must contain the following information:

1. Veteran's and claimant's names.
2. Veteran's military service number.
3. Veteran's Social Security number.
4. Name of the veteran's organization or unit of assignment.
5. Dates of assignment.
6. Full description of duties and activities while a participant in a radiation-risk activity.
7. Specific disease entity ("Cancer" is not adequate; state "cancer of the thyroid," for example).
8. Citation of the specific law and regulations under which request is made.

9. A copy of the claimant's statement must be enclosed. If the statement contains all the items listed in 4 through 8 above, the development letter may refer to the "attached document." If the development includes a request for dosage under 38 CFR 3.311 (see par. 5.12 below), enclose a copy of the information provided in response to development under this paragraph.

(5) All military personnel who served in Japan after the end of World War II were considered part of the occupation forces. Some claims folders may contain VA Form 21-3101, Request for Information, on which the National Personnel Records Center (NPRC) has stated that the veteran was a member of the occupation forces of Japan. This certification may, in conjunction with all other evidence, be sufficient to result in a favorable decision about the veteran's participation in a radiation-risk activity. Such certification from NPRC must contain sufficient information so that a determination can be made about the veteran's presence within 10 miles of the city limits of Hiroshima or Nagasaki, Japan as required by 38 CFR 3.309(d)(3)(vi).

d. **Letters.** A locally generated letter is required for all cases in which benefits are established under Public Law 100-321 and an earlier effective date under other laws is still being considered. The letters must notify the claimants of their rights with respect to the continuing pursuit of their claims on a nonpresumptive basis in order to receive retroactive benefits.

e. **Questions.** Direct any questions on this issue to the Central Office Compensation and Pension Service Procedures Staff (213A).

## 5.12 DEVELOPMENT OF IONIZING RADIATION EXPOSURE

### a. General

(1) The specific criteria for the adjudication of ionizing radiation claims are in 38 CFR 3.311. Because a claim based on exposure to ionizing radiation is a basic claim for service connection, consider the claim concurrently under 38 CFR 3.303.

(2) The regional office is responsible for all development, to include a determination of whether or not all requirements under 38 CFR 3.311(b)(1) are met. If the rating activity determines that at least one of the requirements is NOT met, a rating decision will be prepared without referral to Central Office, that a disease did not result from exposure to ionizing radiation. In all claims, perform a thorough review of the record to determine if service connection can be established under 38 CFR 3.303 or other applicable regulations. The rating decision will be prepared denying the claim if the benefit sought cannot be established under either 38 CFR 3.311 or 38 CFR 3.303.

(3) The rating activity will direct authorization to send the claim to Central Office Compensation and Pension Service (211C) if the three requirements under 38 CFR 3.311(b)(1) are met and development under this paragraph is completed. Central Office (211C) will consider the claim and, if necessary, consult through the Under Secretary for Benefits with the Under Secretary for Health or an outside consultant. Compensation and Pension Service will then furnish an opinion to the regional office recommending either allowance or denial of the claim.

#### b. Initial Review

(1) If a claim is received for service connection for a disability caused by exposure to ionizing radiation, refer the case to the rating activity. The rating activity will review the claim and, if necessary, direct development to determine if service connection can be established under 38 CFR 3.303.

(2) At the same time, the rating activity will review the claim to determine if the requirements for consideration of service connection under 38 CFR 3.311 are satisfied.

(3) For purposes of 38 CFR 3.311(b), the claimant must allege or the evidence submitted or developed must show that:

(a) The veteran has one of the radiogenic diseases listed in 38 CFR 3.311(b)(2) or has submitted or cited competent evidence showing that an unlisted claimed condition is a radiogenic disease.

(b) The veteran was exposed to ionizing radiation during the atmospheric testing of nuclear weapons, the occupation of Hiroshima or Nagasaki from September 1945 until July 1, 1946, or there was exposure to ionizing radiation from other service activities.

(4) During the initial review and development of a claim dealing with exposure to ionizing radiation, if the rating activity determines that at least one of the requirements under 38 CFR 3.311(b)(1) is not met, the rating decision will hold that a disease did not result from exposure to ionizing radiation.

#### c. Development

(1) In all cases, if a reasonable probability of a valid claim under 38 CFR 3.311 exists after the initial review, obtain the following information:

(a) The current diagnosis of the veteran's disease and, if known, the specific cell type and stage. Ask the claimant to provide the date that the disease was first diagnosed or treated, and the name and address of the physician who made the diagnosis or who first treated the claimed condition. Obtain the names and addresses of any physicians who have made subsequent diagnoses or have provided treatment for the claimed condition. If possible, obtain the complete clinical records (not summaries) for all medical care relating to this disability and all tissue blocks, slides or other pathology samples.

(b) The dates, places and circumstances of exposure to ionizing radiation. Ask the claimant to provide this information. Also review the claims folder to obtain this evidence.

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(c) The veteran's history of exposure to known carcinogens, including a post-service occupational history. Ask if, either before or after service, there was exposure to a cancer-causing substance. If the claim is for skin cancer, include the extent of exposure to the sun, e.g., frequent sun bathing or occupations requiring working outdoors. Request the veteran's smoking history.

(d) The history of members of the veteran's family who have been diagnosed as having cancer. Ask whether members of the veteran's immediate family (parents, siblings) have had cancer or leukemia.

(2) Obtain the following information in claims based on exposure to radiation from nuclear atmospheric tests.

(a) The dates and places of the test.

(b) Operation or test shot code names.

(c) The number of tests witnessed.

(d) The organization or unit (ship, task group, company or squadron, etc.) and rank at the time of the test.

(e) The duty place and organizational unit from which the veteran may have been detailed for participation.

(f) Whether a film badge was issued and worn.

(g) The names of other service personnel with the veteran at the time of participation.

(h) A detailed description of activities during the entire period of participation, including:

1. How far was the veteran from the center of ground zero at the time of the explosion?

2. At the time of each explosion, was the veteran in the open, under cover (building, closed vehicle, trench, etc.), in a plane or aboard ship (on or below deck)?

3. Did the veteran move to or toward ground zero after the explosion, how soon thereafter and how close?

4. How long did the veteran remain in the vicinity of the explosion, initially and after advancing toward the area of the explosion?

5. Is the veteran aware of any peculiarity of the trials (unexpected wind change, severe dust conditions, etc.)?

(3) Obtain the following information in claims based on participation in the American occupation of Hiroshima or Nagasaki, Japan prior to July 1, 1946.

(a) The organization or unit (ship, task group, company or squadron, etc.) and rank at the time of exposure.

(b) The duty place and organizational unit from which the claimant may have been detailed.

(c) A description from the veteran and from the service records of activities during the entire period of exposure including whether or not the veteran went ashore, length of time spent ashore and activities while ashore.

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(4) For a claim based on exposure to radiation by reason of the nature of military duties (radiologist, x-ray technician, etc.), prepare a separate VA Form 21-3101 requesting a copy of DD Form 1141, Record of Exposure to Ionizing Radiation, from the 201 file or any other records which contain radiation exposure information.

(5) Each branch of service maintains a record of occupational radiation exposure. If development under subparagraph 5.12c(4) fails to procure a DD Form 1141, prepare a written request to the appropriate branch of service. The request will contain identifying data as required by subparagraphs 5.12d(2)(a) through (g). The addresses for the branches of service are:

Air Force	Department of the Air Force USAF Occupational Health Laboratory (AFSC) Brooks AFB, TX 78235-5501
Army	Chief U.S. Army Ionizing Radiation Dosimetry Center ATTN: AMXTM-CE-DCR Lexington, KY 40511-5102
Navy and Marine Corps	Officer in Charge Naval Dosimetry Center Navy Environmental Health Center Detachment Bethesda, MD 20814-5000
Coast Guard	Commandant U.S. Coast Guard ATTN: Mr. James Veazey Washington, DC 20593-0001

**d. Dosimetry Information**

(1) If the requirements under 38 CFR 3.311(b) have been met and the development specified by subparagraphs b and c above has been completed or there is evidence sufficient to establish the veteran's presence where radiation exposure existed, telephone Central Office Compensation and Pension Service (211C).

(2) Be prepared to provide the following additional information on initial contact with the Compensation and Pension Service (211C):

- (a) File number.
- (b) Social Security number.
- (c) Service number.
- (d) Period of service.
- (e) Claimant's current telephone number and address.
- (f) Veteran's date and place of birth.
- (g) Nature of disability.

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(3) After receiving the approval of the Compensation and Pension Service, write a letter to the Defense Nuclear Agency (DNA), ATTN: RARP-NTPR, 6801 Telegraph Road, Alexandria, VA 22310-3398. Enclose a copy of the claimant's response to the request for ionizing radiation exposure information.

(4) If a dose estimate was submitted on behalf of the claimant from a credible source (38 CFR 3.311(a)(3)(ii)), the rating activity will compare this estimate with the response from the DNA or other official military records. If the rating activity finds a material difference (38 CFR 3.311(a)(3)(i)), the rating activity will direct development to obtain the supporting documentation and methodology used by the credible source.

**e. Development for U.S. Veterans Involved in Non-U.S. Nuclear Bomb Tests**

(1) Public Law 103-446 established veterans' entitlement to the same radiogenic conditions on a presumptive basis for participants in non-U.S. nuclear tests as for participants in U.S. nuclear tests. Develop radiation dose information for foreign test participants, using the addresses and telephone numbers shown below.

(2) It is very important to note on any such request that it deals with non-U.S. test participation. If this is not noted on the RO request, it will be returned to DNA which will in turn return it to the RO.

(3) For non-U.S. test participants involved in flight missions, contact:

HQAFTAC/IGO	Telephone: (407) 494-6867
1030 South Highway A1A	FAX: (407) 494-2318
Patrick AFB, FL 32925-3002	

(4) For all other non-U.S. test participants, contact individual service occupational radiation dose organizations as follows:

Army	Chief, U.S. Army Ionizing Radiation Dosimetry Center ATTN: AMXTM-SR-D PO Box 14063 Lexington, KY 40512-4063  Telephone: (606) 293-3646
Navy and Marine Corps	Officer-in-Charge Navy Environmental Health Center Detachment Naval Dosimetry Center Bethesda, MD 20889-5614  Telephone: (301) 295-5426
Air Force	Commander Dept. of the Air Force, Armstrong Laboratory AL/OEBS, Bldg. 140 Brooks AFB, TX 78235-5500  Telephone: (410) 536-2378

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U.S. Coast Guard

Commandant (G-KSE)  
 U.S. Coast Guard  
 2100 2nd St. SW  
 Washington, DC 20593-0001

Telephone: (202) 267-1368

**f. Referral to Central Office**

(1) If the three requirements of the initial review have been satisfied and development has been completed, including the receipt of the response from the DNA, refer the claim to the Compensation and Pension Service (211C) for review. See 38 CFR 3.311(b)(1). Include a cover letter briefly summarizing the following information:

- (a) Pertinent service information.
- (b) The circumstances, including dates of veteran's exposure.
- (c) A description of the disease claimed, including the specific cell type and stage, if known, and when first manifested.
- (d) Veteran's age at time of exposure.
- (e) Dosage assessment as given by the DNA.
- (f) Time lapse between exposure and onset of disease.
- (g) Gender, pertinent family history and employment history.
- (h) Veteran's history of exposure to known carcinogens or radiation prior to and after service, including smoking history and, if claiming skin cancer, exposure to sun.
- (i) Any other information relevant to determining the cause of the disease.

(2) Compensation and Pension Service will request, through the Under Secretary for Benefits, an advisory medical opinion from the Under Secretary for Health. The Under Secretary for Benefits may also refer the matter to an outside consultant. See 38 CFR 3.311(c) and (d).

- (a) The regional office will notify the claimant of the referral to Central Office.
- (b) The regional office and the claimant will be notified if the referral is made to the Under Secretary for Health.

(3) Compensation and Pension Service will furnish an opinion to the regional office recommending either allowance or denial of the claim. The written response of an outside consultant (if solicited) will also be transmitted to the regional office.

(4) The rating activity will consider the recommendation of the Compensation and Pension Service. The authority to make the final decision remains with the rating activity under 38 CFR 3.311(f).

(5) Use a locally generated letter to notify the claimant of the final decision. See part IV, chapter 8 and paragraph 28.04.

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(6) If evidence (pt. IV, par. 3.06c) submitted in connection with a Notice of Disagreement (NOD) serves to change the decision of the rating activity, the rating activity may, without further consultation with the Compensation and Pension Service, take appropriate action to grant the benefit claimed under 38 CFR 3.311(f).

g. **Expungement of Classified Military Data.** Information relative to military bases where nuclear weapons may be located within the continental United States is classified "Confidential." Locations past or present outside the continental United States are classified "Secret" or "Top Secret." The fact that a veteran inadvertently revealed such information in an application for benefits should not be compounded by further release within or without VA in any manner.

(1) Any classified data will be cut out (rather than obliterated) from such records or statements.

(2) A VA Form 119, Report of Contact, prepared for the claims file and signed by the Adjudication Officer or supervisory designee not lower than the Assistant Adjudication Officer, will cite the kind of evidence removed, the reason for record expungement, and summarize or restate any other obliterated facts or statements not referring to specific military bases where nuclear exposure allegedly occurred.

h. **Subsequent Review.** A claim for compensation based on radiation exposure as a consequence of service with the occupation forces of Hiroshima or Nagasaki, Japan, or in connection with nuclear testing that was denied prior to enactment of Public Law 98-542, The Veterans' Dioxin and Radiation Exposure Compensation Standards Act, on October 24, 1984, must receive a complete, new review if the claim is subsequently reopened. New and material evidence need not be submitted to reopen these claims. Handle this type of claim as if it were an initial ionizing radiation claim. Refer to subparagraph b for proper action to be taken.

#### 5.13 ASBESTOS-RELATED DISEASES

a. **General.** Many people with asbestos-related diseases have only recently come to medical attention because the latent period varies from 10 to 45 or more years between first exposure and development of disease. In addition, exposure to asbestos may be brief (as little as a month or two) or indirect (bystander disease).

b. **Responsibility.** The rating activity is responsible for determining whether or not military records demonstrate evidence of asbestos exposure in service and ensuring that development is accomplished to determine if there is pre-service and post-service evidence of occupational or other asbestos exposure.

#### 5.14 POST TRAUMATIC STRESS DISORDER (PTSD)

a. **Reasonably Supportive Evidence of Stressors in Service.** Any evidence available from the service department indicating that the veteran served in the area in which the stressful event is alleged to have occurred and any evidence supporting the description of the event will be made part of the record. If the claimed stressor is related to combat and in the absence of information to the contrary, receipt of any of the following individual decorations will be considered evidence of participation in a stressful episode:

- Air Force Cross
- Air Medal with "V" Device
- Army Commendation Medal with "V" Device
- Bronze Star Medal with "V" Device
- Combat Action Ribbon
- Combat Infantryman Badge
- Combat Medical Badge
- Distinguished Flying Cross

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d. When all potentially relevant records have been obtained, or it is determined that no further evidence can be obtained, order an examination. The examiner must have all available evidence for review when providing an opinion on the issues of aggravation and the degree of increased disability. Examination reports which are inadequate for rating purposes will be returned for clarification in accordance with M21-1, Part VI, par. 1.09(b).

#### 7.63 BENEFIT-OF-THE-DOUBT

a. Include a discussion of the benefit-of-the-doubt rule whenever a claim is granted on that basis, or is denied but is supported by significant favorable evidence. Describe and weigh the positive and negative evidence. If the claim is denied, a statement concluding that "the benefit-of-the-doubt rule does not apply because the preponderance of evidence is unfavorable" is generally sufficient.

b. When considering claims for compensation if the service medical records may have been destroyed, such as in the 1973 Federal Records Center fire, VA has a heightened obligation to carefully consider benefit-of-the-doubt and corroborative testimony such as buddy statements. In these cases if service connection cannot be granted based on corroborative testimony, the reasons and bases section of the rating must explain why the evidence was not credible or could not be accepted.

#### 7.64 RECONSIDERATION OF PREVIOUSLY DENIED CLAIMS BASED ON EXPOSURE TO IONIZING RADIATION DURING OCCUPATION OF HIROSHIMA OR NAGASAKI OR IN NUCLEAR TESTING

Veterans whose claims for service connection based upon exposure to ionizing radiation as a consequence of service with the occupation forces of Hiroshima or Nagasaki, Japan, or in connection with nuclear testing were denied prior to October 24, 1984, are entitled to a de novo review (a complete, new review) of their claims under Public Law 98-542, the Veterans' Dioxin and Radiation Exposure Compensation Standards Act, which was enacted on October 24, 1984. New and material evidence need not be submitted to reopen these claims.

#### 7.65 ANALOGOUS RATING

If an unlisted condition is encountered, rate under a closely related disease or injury by utilizing a "99" code followed by the diagnostic code for the closely related disease or injury. If a "99" code is utilized, it must be followed by the diagnostic code for the closely related disease or injury, if an evaluation is assigned. The term "evaluation" includes a 0 percent evaluation.

**EXAMPLE 1:** Service connection is assigned for chronic obstructive pulmonary disease, which is not listed in the rating schedule. Rate the condition analogous to a closely related pulmonary condition such as pulmonary emphysema and utilize diagnostic code 6699-6603. The percentage assigned must be supported by diagnostic code 6603.

**EXAMPLE 2:** If the rating schedule calls for rating a specific disability analogous to another listed condition, e.g., coronary artery bypass is to be rated as arteriosclerotic heart disease 1 year post-surgery, use a hyphenated code listing the primary condition first followed by the code for the disability supporting the percentage assigned. In this example the coding is 7017-7005 and the percentage of disability assigned must be supported by the second diagnostic code shown.

**NOTE:** Never use more than two hyphenated diagnostic codes to support an assigned percentage.

#### 7.66 ABBREVIATIONS AND SYMBOLS

A listing of common medical abbreviations and symbols is found in addendum B to this chapter.

1. **Attachment E: Radiation Statistics**

**RADIATION STATISTICS**

Total Number of Radiation Cases:	18,515
Total Number with Service Connection:	1,886

These statistics are as of April 1, 1996. The "Total Number with Service Connection" represents the number of cases in which service connection has been granted for a condition claimed to be the result of radiation exposure. It cannot be inferred from this number that service connection was necessarily granted on the basis of radiation exposure.

The following statistics, as of April 1, 1996, represent the number of claims in the exposure categories indicated. However, an "\*" indicates that the figures represent only claims in which VA has granted presumptive service connection.

Atmospheric Testing (§ 3.311)	8,140	(Total = 8,440)
Atmospheric Testing (§ 3.309(d))	300 *	
Hiroshima/Nagasaki (§ 3.311)	3,819	(Total = 3,989)
Hiroshima/Nagasaki (§ 3.309(d))	170 *	
Occupational/Therapeutic (§ 3.311)	3,210	
Other (§ 3.311)	2,876	
TOTAL	18,515	

**NOTE:** As of April 1, 1996, VA had granted service connection to 8,835 "atomic" veterans for all service-connected conditions, regardless whether or not the veterans had claimed they were due to radiation exposure.



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