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United States Senate

COMMITTEE ON VETERANS' AFFAIRS

WASHINGTON, D.C. 20510

March 30, 1984

DNA1:940923:053

Lieutenant General Richard K. Saxer
Director
Defense Nuclear Agency
Washington, D.C. 20305

Dear General Saxer,

I am writing to request information on the current status of the Defense Nuclear Agency's efforts with reference to the 1946 atmospheric nuclear testing series, Operation Crossroads.

As you know, at the House Committee on Veterans' Affairs Subcommittee on Oversight and Investigation May 24, 1983, hearing on veterans' exposure to ionizing radiation, a collection of papers belonging to the late Colonel Stafford Warren, Chief of the Radiologic Safety Section for Operation Crossroads, was presented and was the subject of some discussion at that time.

Following the hearing, your predecessor, General Harry Griffith, in a June 23 letter to House Committee Chairman Montgomery regarding the Warren documents, stated that they were not yet completely catalogued, listed, or summarized and that "DNA is now indexing some of the documents in the course of our ongoing analysis."

It has been alleged by the National Association of Atomic Veterans that the Warren papers suggest that the service personnel who participated in Operation Crossroads may have received more exposure to ionizing radiation than has previously been reported by the government. In reviewing the Warren documents, I was struck by the concern of the radiation safety section about the extent of contamination of the ships, the crude monitoring devices available, and the extent and potential danger of inhalation and ingestion of radioactive particles. As the largest test operation in terms of participants -- Crossroads' 42,000 participants constitute roughly one fifth of all the atmospheric nuclear test participants -- any new or revised information regarding the exposure of the participants in that operation will have an impact on a substantial proportion of the radiation-related veterans' claims for disability compensation. Hence, I am writing to find out the status of DNA's analysis of the papers.

HRE-0652

I am also concerned that the VA be kept abreast of your analysis of these records. The VA's Board of Veterans' Appeals, when presented with information from the Warren papers in support of a veteran's claim, declined in a November 10, 1983, opinion to consider the information and stated:

The Department of the Navy is apparently investigating the documents which have been made available by the widow of the late Stafford L. Warren. It may well be that the department will eventually wish to revise its radiation exposure report in this case on the basis of information obtained from those documents. At present, however, the question of whether or not the veteran may have received radiation exposure greater than that previously reported remains in the realm of speculation.

In light of the above, I would appreciate your attention to the following requests for information:

1. In order to have a better understanding of the current status of these documents, I would very much appreciate receiving as soon as possible your written assessment of the Warren documents together with a discussion of any specific actions that have been or will be taken as a result of DNA's analysis of the documents.

2. I would also appreciate your specifically addressing the ingestion/inhalation issue with respect to Operation Crossroads. As you know, Colonel Warren, in his collection of documents, repeatedly expressed concern over the hazards in Operation Crossroads of exposure through inhalation. In a memo (copy enclosed) to the Commander of the Joint Task Force regarding occupation of target vessels, he said:

There is a subtle inhalation hazard the exact magnitude of which is not known but which may be serious.... No masks will filter out the finest particles.... Unfortunately this hazard persists long after gamma radiation does.

In a December 31, 1946, letter to Dr. William G. Myers of Ohio State University, he stated, "I agree entirely that the greatest hazard is the insidious long-term exposure to long-lived isotopes...."

In this regard, I would particularly like to know whether DNA's analysis of the Warren papers has generated any re-computation of either internal or external dose estimates for any groups of Crossroads participants or individual participants.

3.A. In reviewing BVA opinions, I have noted that, according to information provided by the Nuclear Test Personnel Review, the maximum exposure in Operation Crossroads was 3.52 rem gamma. However, an undated document from the Warren collection (copy also enclosed) reports that "men were in the superstructure [of the ship] where readings of 5R were common." Please investigate the circumstances of this situation and indicate whether, in light of this statement, you still believe that 3.52 rem is an accurate maximum dose assignment for this operation.

B. In a December 31, 1946, letter from Colonel Warren to Dr. William G. Myers (copy enclosed), Colonel Warren mentions that as a result of his concern over exposure levels, urine monitoring was undertaken. He does not say what the results of that monitoring were or whether it led him to believe that the levels of exposure were high or not. What do other records of this operation show about exposure levels based on the results of urine or other non-film badge monitoring of participants.

C. On a related matter, I have long been concerned generally about the possibility of ingestion and inhalation of radioactive particles by the participants in atmospheric nuclear testing. In connection with the Senate Veterans' Affairs Committee's April 6, 1983, hearing on veterans' exposure to ionizing radiation, General Griffith reported, "In those circumstances when [internal] doses may have been a factor, internal dose reconstructions are being made." Please provide a list of those shots for which internal dose reconstructions have been made or are being planned, including the number of participants each reconstruction would affect and the exposure level assigned for the completed reconstructions.

4. I would also like to know what information about the Warren papers has been provided to the VA to date and what provisions have been made to provide any further information on this subject to the VA.

Thank you for your attention to this letter.

With best wishes,

Cordially,



Alan Cranston
Ranking Minority Member

Enclosures

cc: Honorable Harry N. Walters
Kenneth E. Eaton, Esquire
Dr. Donald L. Custis
Ms. Dorothy L. Starbuck

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BY AUTHORITY OF _____

Copy 6 of 6

c/o Fleet Post Office
San Francisco, California

August 1948.
CLASSIFICATION CANCELLED
DATE JUN 8 1965
For the Atomic Energy Commission
Influenced by
ROBERT L. JACKSON
for the
Chief, Declassification Branch

From : Radiological Safety Advisor.
To : The Commander Joint Task Force
Subject: Occupancy of Target Vessels as
Intensity of Radiation of Various
Target Vessels.

1. GAMMA RADIATION: (a) First Stage - radiation particulates, instrument recovery particles, and work particles are permitted aboard target vessels when the intensity of gamma radiation is such that the exposure for the elapsed time is no more than 0.1 r. This must include the exposure while approaching the ship to be boarded and while within on the deck or other vessel transporting the learning teams. There is very little leeway in this since a proximately 10% of the daily permitted dose is already taken up by the exposure while all the Task Force are subjected every day while living in the labors. Furthermore the erratic location of high and low intensities on the target ships does not permit an accurate estimate of any one individual's exposure since he may be in a location or near a high intensity than was expected, thus accumulating more than a tolerance dose. Up to the present time, this extra exposure has been of no serious moment but as the number of personnel on target vessels becomes greater and the time spent on board by re-exposure increases, day by day, this factor will become more and more serious. (b) Second Stage - As the intensity of gamma radiation diminishes by way of decontamination procedures and decay, more and more pressure develops for putting full crews aboard to work and live and eat aboard. This pressure has already become acute as the intensity of gamma radiation drops below the average of 1.0 r/day, when the elapsed time permitted is two hours or greater. This is a practical working period for successive shifts and large numbers of men can be employed in cleaning up ships decks. This period is also the period of greatest danger of contamination of the hands, feet, and clothing of the working parties. There is a subtle inhalation hazard the exact magnitude of which is not known but which may be serious. This exists in the form of fine dry particles, spray and fine water droplets which contain fission products. No masks will filter out the finest particles. As the use of a sense of security they are not recommended. (c) Special precautions can be used

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By Authority of the Atomic Energy Commission
JUN 21 1948
Document No. LXII - 2-6A
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to protect personnel against this inhalation hazard. Unfortunately this hazard persists long after gamma radiation ceases.

2. BETA RADIATION: Third Stage - When the intensity of gamma radiation has been reduced to 0.1 r/day, there exist high intensities of beta radiation in various ratios, varying between 200-500 times that of the gamma radiation. Contamination of hands and faces with beta emitters of intensities greater than tolerance (0.2r/day) is exceedingly common. It is not infrequent to find personnel with amounts on the bare hands ordering on erythema dose levels (if not removed within 24 hours). It is almost impossible to enforce the wearing of gloves continuously on badly contaminated ships, during the clean up stages under present circumstances where large numbers of men are involved. Nor is it feasible to expect them to take the proper care of their contaminated clothes. Practices which can be applied with safety in plants through long time supervised training and guidance cannot be employed with safety in the attack on the present problem in the time available to conduct the proposed study of the target ships.

3. ALPHA EMITTERS: Fourth Stage - As each ship becomes clean enough for continuous occupancy, the amount of alpha emitting material must be considered. The greater the original contamination the greater is the intensity of alpha contamination to be expected. Its detection is a matter of great difficulty yet it is insidiously toxic in very minute quantities. Where only one or two lethal doses are spread over a whole ship the problem is small and of no consequence. However some of the most important ships have had many lethal doses deposited on them and retained in crevices and other places involved in the final clean up stages where scraping and other dry methods of removal will be used. Here the inhalation hazard will be extensive and unpredictable. It can only be evaluated by a careful survey of each ship during the progressive phases of the clean-up. This decontamination requires meticulous care and an elaborate set up of equipment and trained men, none of which are available within the resources of the JTF-2 and the Manhattan District. Trained personnel and equipment will have to be developed over a matter of four or more months of intensive work and instrument building.

4. The Radiological Safety Section was brought out to Bikini on the basis of a short term safety program. It was understood that the key personnel were to be returned to the United States by 1 September. It was especially difficult to obtain personnel having proper qualifications after Presidential postponement of the attack. Additional qualified men and instru-

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ments are not available over: now. Universities, Manhattan District Laboratories and plants, and various civilian and military and naval organizations loaned men for this short error period, only. These men are urgently needed by their employers at home on the dates agreed to before here. Instrument technicians (enlisted men) were persuaded to sign up until 1 September. They now insist upon returning to continue their schooling. Were it not for these qualified agreements, personnel for the Radiological Safety Section could not have been assembled. Those who have participated have been worked hard for days and nights and they are approaching physical exhaustion. Monitoring demands have been increasing steadily while our numbers are being depleted by return airlifts (those in accordance with previous contracts). Attempts to delay these men has not with unanimous refusal. The training program undertaken during the two tests has produced about twenty fairly good monitors out of the seventy bodies -- (provided they are properly supervised).

4. INSTRUMENT SUPPLIES: Relatively few instruments remain in trustworthy condition. Intensive work is going on now on the Haven to provide for all that can possibly be left with the Task Force. Only the following are or will be usable conditions: (a) 20 - 267 Ion chambers for high intensity survey work. These will have an attrition rate such as to deplete them entirely in about three months. There are no replacement parts for repairs (except by cannibalism). (b) 20 - 2-203 Geiger Counters for detecting safe occupancy. These are especially delicate instruments and it can be expected that their attrition rate will be very high, especially because of their past hard usage. They are difficult to repair. Spare parts for them have been consumed. They will last about six weeks and will have to be replaced. (c) One-hundred pencil electrometers to measure daily dosages. Attrition will be about 10% per week and repairs can only be done at the factory. Replacements can be made by mail beginning in about one month. (d) Diving ion chambers have been designed and built on the Haven since test 1110. Many of these fail due to leakage after one or two days use. This instrument should be redesigned and built to withstand the high pressures of deep water. It is estimated that no less than two months will be required for this. (e) The alpha rotors are delicate laboratory instruments and need constant care. Those used so far have had hard usage and will last only a few days more at best. 1107

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need new parts which are not available. This type of equipment too, should be redesigned to satisfy the particular requirements here. (f) Five filter quoms (115 c.c.) for measuring air hazards when ventilation is turned on in target ships. These require alpha measuring devices for only a rough index can be obtained from the beta gamma measured on the filters. Even with negative findings by this instrument alpha emitters still may be present when beta gamma emitters are low or absent in the collected dust. Thus a guarantee for safe occupancy cannot truly be given on any apparently completely contaminated ship. (g) Photography - One well trained enlisted man is available and adequate equipment. Enough film is available for about three weeks work at a slower tempo and a sufficient additional supply has been ordered. Only one hundred personnel badges can be processed and analyzed daily for the next month. The one qualified man can train assistants to increase the output to 300 per day in a month's time. A record of each man's daily exposure can thus be made, to provide medical legal records. It is obvious however that the working parties on target ships must be restricted to the above numbers.

6. THE LAGOON VESSEL HAZARD: The evaporators and salt water lines and bottoms of all ships in commission in the lagoon have continued to store up active materials. This group of vessels should be removed from the lagoon as soon as possible to reduce this slowly developing hazard. Monitoring of each evaporator cleaning will be necessary at the lagoon or at every base where these ships dock if chemical treatment is not satisfactory. The hulls may clean up on the way home yet any ship put up in dry dock should be monitored before the hull is cleaned. As much as the equivalent of 1 μ r. of radium per ton of dry weight of evaporator scale or hull marine growth is now contained in an on these ships. The amount increases daily in spite of the continued decrease in concentration of the lagoon water and far exceeds the loss by the docking rate.

7. CONTAMINATION: The target vessels are in the main extensively contaminated with dangerous amounts of radioactivity. Such decontamination without exposing personnel seriously to radiation is not possible under the present circumstances and with present knowledge. Control of the safety of target ships' crews is rapidly getting out of hand. Adequate monitoring personnel and instruments are no longer available. The present stage of survey and experimentation is about finished and indicates

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the urgent need for an extensive program suited to the local requirements. This will take matters of propagation, instruction of personnel, and fabrication of instruments. The Task Force finds itself at a period where no further gain can be obtained without great risk of harm to personnel engaged in decontamination and survey work unless such work ceases within the very near future.

3. RECOMMENDATIONS (a) It is recommended that the present operations in the Bikini lagoon be terminated on 15 August 1946 since there is neither equipment nor adequate monitoring personnel available to continue safely operations beyond this date. (b) It is recommended that a small force be organized and left at Bikini as a stop gap to continue (1) small scale studies of decontamination procedures (2) recovery of such instruments as become available (3) to prevent the sinking of whatever vessels that can be saved without risk of exposing personnel to dangerous amounts of radioactivity (see attached proposed monitoring plan). (c) If it is contemplated that the Task Force return to Bikini either for further study of the problem now presented or to prepare for test Charlie it is recommended that the proper arrangements be made and facilities be made available to handle the problem of decontamination on the large scale necessary to do so. These recommendations are made only after mature deliberations and have the unanimous support of my nuclear local advisors and the whole membership of the Radiological Safety Section.

Stafford L. Warren
Colonel, MC.

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- Col. ... L. Warren
- File

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December 31, 1946

Dr. William G. Myers
Department of Medicine
The Ohio State University
Columbus 10, Ohio

Dear Bill:

Thanks very much for your letter and its enclosures. I am forwarding a copy to our Washington office so that your suggestions may come to the attention of the planning group.

There are one or two comments I would like to make. You must remember that the Bikini test, insofar as our section was concerned, was conducted as an emergency and a lot of compromises were made to meet this emergency. The test turned out to be literally a hundred times larger than the original conception. We had no time to train sufficient men to do the job but had to strip the Manhattan District and call upon knowledgeable civilians like yourself for personnel. We had to make decisions on instruments in order to get them manufactured and delivered. These decisions had to be made at a time when the instrument manufacturing program was non-existent and had to be re-created and we had to make essentially what could be made. The 263 had a great many defects but it did fill one particular need; namely, that of a light detection and scouting instrument. It never was designed to be used as a measuring instrument although we were forced, because of lack of other instruments, to use it as such. It will probably take ten years of intensive work to get a fool-proof set of meters suitable for war purposes. The Cutie Pie also had defects but the principle is a good one, as you point out.

We had to deal with various stages in the Bikini test after Baker. The first and most urgent stage was that of the gamma radiation. The beta radiation did not become a problem until the decay rate had eliminated most of the hazard from the gamma radiation, although it was always present.

After you left, we set up a change ship to monitor the clothes and the bodies and later, ~~we monitored the urines.~~ I don't believe you are an alarmist, but I never want to go through the experience of the last three weeks of August again. The air inhalation possibilities and all of the rest

Dr. Wm. G. Myers

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December 31, 1946

indicated conclusively that, just upon the basis of statistics alone, we were certain to get into trouble if we did not close the operation shortly. I agree entirely that the greatest hazard is the insidious long-time exposure to long-lived isotopes and low concentration in bombed cities where the under-water detonation has been used. I believe they would be uninhabitable for several generations.

I realize that you wrote this letter in August but I still think your ideas are appropriate.

With the best wishes to you and your confreres and a Happy New Year; and with greatest appreciation for your assistance in Crossroads operation, I am

Cordially yours,

STAFFORD L. WARREN
Medical Advisor
Manhattan District

SLW:m

RADIOLOGICAL SAFETY SECTION
JOINT TASK FORCE ONE
USS HAVEN (AH-12)

At 0800 I went to the Whiting. At 0930 Mr. Walsh of the Whiting and I went to the USS New York to inspect some damage to the superstructure. We boarded the ship at 0955. Our work was complete at 1030.

Maxium	above decks	6 R
Average	above decks	22 R

Men were aboard the ship in large quantities with no film badges or monitors. These men were in the superstructure where readings of 5 R were common. We obtained a dosage of 0.05 R/24 in thirty minutes in places where some of these men had been for a much longer time.. Either these men should not be left such a position or there is no need for a monitor for men who are going in the same places for much shorter periods of time. It is recommended that one course be followed.

*U. S. Navy copy
to Lt. Col. R. L. Harrison
Colonel Kelly*