401514

DRAFT

The Honorable Paul G. Rogers
House of Representatives
Washington, D. C. 20515

Dear Mr. Rogers:

On behalf of the Secretary of Defense, I am pleased to respond to your letter of April 21, 1978, concerning radiological safety aspects of DoD's role in the cleanup project for Enewetak Atoll. In the six years since inception of the project, no facet of planning and execution has received more intense and continuing emphasis than radiological safety measures to protect those carrying out the cleanup.

Before responding to your specific questions, let me offer to brief you and your staff in person on the cleanup and related health physics considerations. I believe such a briefing would provide you a deeper understanding of the extraordinary radiological safety precautions that have been in effect from the outset, and would give you the opportunity to satisfy yourselves, through detailed questioning, of specific matters that might not have been touched upon in your questions or in the answers provided herein.

As background for addressing the specific issues, it might be useful briefly to review the history of this operation. In 1947 the people of Enewetak Atoll were relocated to Ujelang Atoll so the United States could use Enewetak for nuclear weapons tests. Forty-three nuclear detonations took place at Enewetak between 1948 and 1958.

In 1972 Ambassador Williams announced that the United States was prepared to clean up, rehabilitate, and return the Atoll to its people. At this time the Atomic Energy Commission (now the Department of Energy (DoE)) and DoD were tasked to do the preliminary surveys and planning. DoD was tasked to perform the cleanup itself, DoE to provide radiological support and certification, and the Department of Interior (DoI) to accomplish rehabilitation and resettlement.

[redacted] 5010917

DRAFT

In FY 1975 DoD requested a military construction appropriation to accomplish the cleanup using civilian contractors. Congress did not authorize this appropriation, and instead directed that project planning be revised to make use of military personnel and equipment.

In the FY 1977 military construction appropriation, Congress provided $20 million to partially fund the cleanup, stipulating that "all reasonable economies should be realized in the accomplishment of this project through the use of military services' construction and support forces, their subsistence, equipment, material, supplies, and transportation which have been funded to support ongoing operations of the military services and would be required for normal operations of these forces."

This direction from Congress required that DoD not only manage the cleanup operation, but that DoD personnel actually perform the cleanup. The Army, Navy, and Air Force were accordingly tasked to provide personnel and equipment to perform the various jobs required. The Director, Defense Nuclear Agency, was appointed as the DoD Project Manager for the cleanup itself.

Since your interest is primarily in the radiological aspects of the cleanup, I might describe the Department of Energy's role in more detail. The DoE is responsible for providing technical support to the DoD Project Manager, for characterizing and defining the radiological environment, for establishing the criteria for cleanup levels, and for certifying the radiological condition of the Atoll after the cleanup effort.

The cleanup portion of this program, managed by DoD, consists of three separate efforts: removal and lagoon-dumping of uncontaminated debris and structures; removal and crater-disposal of radiologically contaminated debris and structures; and excision and crater-disposal of some of the radiologically contaminated soil that remains on the islands.

The radiological contaminants are described in detail in AEC Report NVO-140, October 1973, attached. The distribution of the radiological contaminants is shown to be limited roughly to the northern half of the islands of the Atoll.

Typical total external average radiation exposure rates, in the southern islands are less than one microroentgen per hour. The exposure rates for the northern islands are higher, as one would expect from test history. These levels range from total external average exposure rates of 5 microroentgen per hour to around 100 microroentgen per hour. As a matter of interest, external exposure rates in the United States from natural background ranges 6 to about 10 microroentgens per hour.

The primary radioactive isotopes are cesium-137, cobalt-60, strontium-90, and transuranic elements (plutonium and americium). The former isotopes are relatively short-lived; whereas the transuranic elements are long-lived. The primary purpose of the radiological soil cleanup is to reduce the transuranic elements to levels that do not pose long-term hazards to the returning people of Enewetak. Of course, in removing soil which contains transuranics, any other radioisotopes present will also be removed.

Service personnel who have the potential for being exposed to radiation consist only of those who are actually engaged in the removal and disposal of the contaminated debris, structures, and soil. Typical duties involve operating bulldozers, backhoes, trucks, cranes, cement mixers, and boats. The attached Operation Plan will provide a basic understanding of the overall effort. Of the 650 DoD personnel on the Atoll, possibly 400 have the potential for being exposed to radiation.

The overall philosophy is for operations to be conducted in such a manner as to assure that radiation exposure to individuals is limited to the lowest levels practicable. The cleanup radiation exposure standards are based on Title 10, Code of Federal Regulations, Part 20, as implemented in Department of Army Regulation 40-14, Control and Recording Procedures for Occupational Exposure to Ionizing Radiation. The limits for exposure in this regulation are 5 rem per year, or 1 1/4 rem for any three consecutive months.

The basic standard operating procedures for the cleanup radiation safety program were prepared by a group of experts from DNA, DoE, Sandia Laboratories, Los Alamos Scientific Laboratory, and Lawrence Livermore Laboratory. The program is implemented in the field by a specially trained group of Air Force personnel organized into Field Radiation Support Teams. These teams are under the supervision of radiation safety experts in the Radiation Control Division of the Joint Task Group on the Atoll. An on-site Radiation Control

Committee, which includes a medical doctor, a DoE representative, and a representative from each of the Service elements, monitors the overall radiation safety program. In addition, an independent audit and inspection team of experts headed by the Director, Armed Forces Radiobiology Research Institute, and including representatives from DoE, the three Services, and AFRRI visit the Atoll on a quarterly basis to ensure the program is being properly implemented.

In order to assure compliance with these standards and insure that any exposure is kept to a minimum, access to the contaminated islands is rigidly controlled. When personnel do work on these islands, it is under the supervision of the Radiation Control Committee, and under the constant surveillance of a Field Radiation Support Team. This team monitors the local radiation environment, continually samples the air for airborne activity, determines the level of protective equipment needed, and monitors personnel for contamination. Specific procedures have been formulated to provide detailed day-to-day guidance on safety and other procedures pertaining to operations that might involve radiological contamination (copies attached).

Although the low gamma radiation levels found at Enewetak Atoll would not normally require a full-scale dosimetry program, we have chosen to establish one. All personnel who work on, or visit, the contaminated northern islands (the controlled islands) are issued a film badge on a monthly basis. Self-reading ionization chambers (pocket dosimeters) are also issued, as required, to supplement the film badge program, and are read on a daily basis.

Whenever earth-moving operations are to be conducted in contaminated areas, water sprinklers are set up to minimize resuspension of contamination. During transit the trucks are wet-down and covered with tarpaulins for the same reason. Air samplers are set up immediately downwind of the operation to monitor any airborne hazard. Personnel involved in earth-moving operations wear respirators and protective clothing. Urine samples are collected from personnel who have worked on the controlled islands to monitor for possible internal plutonium contamination.

The effectiveness of this extremely conservative approach toward sampling the radiological environment and controlling exposure to it is borne out by actual radiological exposure data over the first year of operations.

DRAFT

As far as exposure to external gamma radiation is concerned, our calculations have shown that exposures should not exceed 60-70 millirem per month. To date, in the hundreds of film badge readings taken, only 44 positive values have been recorded, with the highest being 70 millirem, and only 4 (70, 70, 50, 42 millirem) exceeding 10% of the permissible monthly exposure of 416 millirem.

As far as internal exposures, our intensive measurement program has shown no evidence of any intake whatsoever. In the thousands of hours of air sampler operation, no airborne radioactivity above background has been detected. No indication of internal exposure has been detected in analysis of face mask filters, and bioassay urine samples on departing workers with a potential for exposure have all been negative.

In regard to your suggestion that the Services might want to consider using only volunteers in the cleanup work, this is being done insofar as practicable. Except for a few of the DoD personnel (such as the Joint Task Group headquarters), assignment to the Atoll is for a 150- to 170-day temporary duty period. The few exceptions are assigned for a one-year tour. Each Service handles its personnel assignment slightly differently, but in each case, every effort is made to obtain volunteers. Quite obviously it would be impossible to man such an effort with the requisite skills, over the nearly three-year life of the project solely with volunteers. To date many, though certainly not all, of the personnel engaged have been volunteers.

The participants are fully apprised of the known and potential radiological risks involved in the operation. Upon arrival, all personnel receive an initial orientation covering the operation and the potential hazards, not only radioactive, but also sunburn, coral, fish and others. Those who are to be engaged in cleanup of radioactive materials undergo additional training covering operations in a controlled area and the risks expected. Further, each Service conducts its operations under close leadership and supervision, and in accordance with the pertinent directives, regulations, and standard operating procedures.

As regards permanent records, DNA has established a central computerized data base at Field Command in Albuquerque

[redacted]

DRAFT

to record the pertinent data on all personnel involved in the cleanup and, for those working with radioactive materials, to record all exposures. The data base includes a record of operational activities, the type of work being done, location, air sampler readings, radiation survey readings, personnel dosimetry and urine sample results. These records will be stored permanently, and a computer-based ready-retrieval system is being developed.

Other permanent records are being kept as well. Prior to arriving on the Atoll individuals undergo pre-deployment physical examinations which pay special attention to past history of exposure to ionizing radiation and baseline blood counts. The results are entered in individual permanent medical records. The monthly film badges from Enewetak are processed by Lexington Blue Grass Army Depot Activity, which maintains its own permanent record of the results, and sends a copy to the Joint Task Group Radiological Protection Officer for entry in individual medical records. Thus any exposure received by an individual while on the Atoll will be entered in his own medical record as well as into the DNA central data base. Should exposures warrant, whether recorded by dosimetry or shown by bioassay results, follow-up examinations and tests will be instituted.

In summary, we are providing extraordinary every possible protection to personnel engaged in work with radioactive materials. The protection is so extensive that audit and inspection teams have repeatedly advised that the measures are overly protective, considering the hazard involved, and should be reduced. We are providing what is probably the most complete record system ever established for any operation involving radioactive materials. It has been, and will continue to be, our objective to insure that personnel exposures to radiation are limited to the lowest levels practicable, and that safety of personnel is the overriding priority in the operation.

On behalf of the Secretary of Defense, and all of us involved in the cleanup project, I would like to express appreciation for your interest and concern over the health and safety aspects of this difficult but most important mission. I stand ready to brief you or your staff, or to provide any additional information desired.

Sincerely,

19 Enclosures
See attached listing

R. R. MONROE
Vice Admiral, U.S. Navy
Director

[redacted]

5010922

DRAFT

ENCLOSURES

1. U.S. Atomic Energy Commission Report NVO-140, Vol I-III, October 1973, the Enewetak Radiological Survey.

2. FCDNA OPLAN 600-77, 29 April 1977, Cleanup of Enewetak Atoll, Marshall Islands.

3. Standard Operating Procedures:
   a. 608-01, 21 Jul 77: Air Particulate Sampling Procedures
   b. 608-02.1, 3 Dec 77: Debris Survey Procedures
   c. 608-03.1, 12 Dec 77: Decontamination of Facilities and Equipment
   d. 608-04, 5 Jul 77: Hot Line Procedures
   e. 608-05, 5 Jul 77: Respiratory Protection
   f. 608-06, 12 Oct 77: Radioactive Source Test Procedures
   g. 608-07, 12 Oct 77: Source Accountability and Control Procedures
   h. 608-08, 9 Nov 77: Radiological Guidelines for Ground Zero Operations
   i. 608-02, 21 Jul 77: Radiation Dosimetry Records
   j. 608-04, 20 July 77: Bioassay Procedures

4. Enewetak Atoll Instructions

   a. 5701, 15 Aug 77: Radiological Briefing for Arriving Persons, Enewetak
   b. 5702, 15 Aug 77: Access to Radiologically Controlled Islands
   c. 5703, 18 Aug 77: Radiation Monitoring of Blasting Operations
   d. 5704, 29 Oct 77: Radioactive Source Test Procedures
   e. 5705, 1 Feb 78: FRST Training
   f. 5706, 29 Mar 78: Administration of Personnel Dosimetry Program
   g. 5707, 3 Apr 78: Personnel Protection Levels

[redacted]