DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC

6 December 2013

HQ USAF/SG MEMORANDUM FOR THE HOUSE ARMED SERVICES COMMITTEE

FROM: HQ USAF/SG
1780 Air Force Pentagon
Washington, DC 20330-1780

SUBJECT: Report On Implementation of the Recommendations of the Palomares Nuclear Weapons Accident Revised Dose Evaluation Report (FY14 NDAA SEC. 1080A)

Thank you for the opportunity to discuss the Air Force views on the Fiscal year 2014 National Defense Authorization Act. The attachment addresses the Air Force response to the recommendations of the 2001 Labat-Anderson Inc. revised dose evaluation report for the Palomares nuclear weapons accident. Following a comprehensive review of all data generated from 1966, my staff revised our response methodology for ionizing radiation dose inquiries involving Palomares incident participants.

Biomonitoring today, though technically feasible, is not expected to confirm a correlation between health outcome and exposure due to the low exposure levels. The Air Force is able to establish an upper bound on possible exposures for response personnel, based on the "High 26" cohort (considered the highest exposed 26 individuals), using actual bio-monitoring results from a time close to the actual exposures and will apply this conservative approach in addressing requests from Veterans Affairs for exposure assessments. This revised conservative approach will afford the veteran with the benefit of the doubt as to level of exposure. Hence, we do not recommend additional, broad-scale, follow-up biomonitoring.

I appreciate your interest in this matter and trust this information is helpful.

THOMAS W. TRAVIS
Lieutenant General, USAF, MC, CFS
Surgeon General

Attachment:
Implementation Report; Palomares Nuclear Accident Revised Dose Report (2001)

REPORT ON IMPLEMENTATION OF THE RECOMMENDATIONS OF THE PALOMARES NUCLEAR WEAPONS ACCIDENT REVISED DOSE EVALUATION REPORT (FY14 NDAA. "SEC. 1080A)

Introduction:

A nuclear weapons accident occurred on January 17, 1966, over Palomares, Spain, when a United States Air Force (USAF) B-52 bomber and KC-135 tanker aircraft collided. The accident led to the release of four thermonuclear weapons. Two of the weapons were damaged when they impacted the ground, causing a release of radioactive plutonium. This release resulted in a three-month response effort to identify, characterize, remove, and remediate the accident site. During the response effort, some personnel were exposed to airborne dust and debris contaminated with plutonium.

The response effort began on the evening of January 17. A base of operations (Camp Wilson) was established, and measurements for released plutonium began on January 18. The response force peaked at about 680 U.S. personnel on January 31, and then gradually fell until the effort ceased on April 11. Approximately 1,600 personnel participated during the operation. Urine samples were collected from 1,586 response personnel and nasal swab samples from 120 personnel while on site to assess possible intakes of plutonium and the potential effects on health. The sample results were evaluated in terms of a maximum permissible level used at the time.

The Air Force Medical Service (AFMS) established the Plutonium Deposition Registry Board in 1966 to oversee exposure assessment and biological monitoring. The assessment program concluded that of the nearly 1,600 participants, 26 personnel represent the highest exposure cohort. Those 26 (referred to as the "High 26") were followed up for a period of 18 to 24 months following the accident. The Board monitored and evaluated exposure assessment activities, but suspended efforts in 1968. The AFMS determined little additional information could be gained from continuing the effort as collected samples from the highest exposed personnel showed no detectable radioactivity from urine bioassay analysis.

Discussion:

The AFMS contracted out a "re-look" of exposure and biological monitoring data using the most up-to-date methods for estimation of plutonium intake and committed dose (total dose integrated over a fifty-year period following intake). That effort, completed in 2001, essentially confirmed the overall conclusions from 1968 that adverse health effects would not be expected for responders to the accident, but offered three recommendations on actions that might be taken to improve the estimates of plutonium intake and committed doses, and provide further explanation of the discrepancy between the initial high bioassay (urinalysis) results and exposure estimates from environmental sampling.

Recommendation 1. Consider reconciling the estimated intakes and doses derived from the urinary bioassay data with the estimates from environmental measurements. A targeted effort that includes participant activities, participant interviews, urine and other appropriate

plutonium analyses using current techniques, medical records review, and modeling should be considered.

Response: In 2001, the Air Force Medical Service determined additional bio-monitoring to reconcile the difference between the estimated intakes and doses derived from the urinary bioassay data with the environmental measurements was not necessary. Further, additional bio-monitoring was not expected to produce higher dose estimates than those calculated in the 2001 report. As part of our most recent reassessment, we considered improved detection sensitivity/selectivity for further bio-monitoring that became available in 2011. While there is some scientific "value" in studying why the air sampling results predict exposures less than those predicted from the biomonitoring, we believe existing biomonitoring information is sufficient to reconstruct doses and establish an acceptable upper bound on possible exposures. This information can and should be used to provide the conservative (worst case) estimate of exposure for responders.

Recommendation 2. Consider communicating the results of this effort to responders, veterans organizations, and other interested parties using appropriate information that clearly confirms the conclusions of the original medical evaluation program, recognizes the difficulties in preparing updated intake and dose estimates, and outlines the options for strengthening the estimates.

Response: In May 2002, the AFMS created a public web site and posted the 2001 report along with a summary of the report to communicate the results to the general public. The 2001 report did not change the conclusions reached from the initial assessment concluded in 1967.

Recommendation 3. Consider further contacts with the Department of Energy (DOE). Comparison with evaluations of their personnel who responded to this accident could provide useful data. The effort should be summarized in a companion document that conveys the details of the project and its potential effects on health in an easily understood manner. That document should be made available to any of the responders who desire a copy.

Response: Few Department of Energy (DOE) personnel directly participated in the clean-up and monitoring efforts. DOE (Atomic Energy Commission at the time) did not collect monitoring data; therefore a direct comparison is not possible. The DOE also, for a time, maintained a webpage on the Palomares incident for the general public.

Conclusion:

The follow-up biomonitoring results obtained in 1967 provide a reasonable, yet conservative (worst case) exposure estimate for response personnel. Modeling methods currently available to perform dose reconstructions would not change the fundamental conclusions reached in 1968 that adverse acute health effects were neither expected nor observed, and long-term risks for increased incidence of cancer to the bone, liver and lung were low. Biomonitoring today, though technically feasible, is not expected to confirm a correlation between health outcome and exposure due to the low exposure levels. The Air Force is able to establish an upper bound on

possible exposures for response personnel, based on the "High 26" cohort (considered the highest exposed 26 individuals), using actual bio-monitoring results from a time close to the actual exposures and will apply this conservative approach in addressing requests from Veterans Affairs for exposure assessments. This revised conservative approach will afford the veteran with the benefit of the doubt as to level of exposure. Hence, we do not recommend additional, broad-scale, follow-up biomonitoring.

References:

Labat-Anderson, Inc. "Palomares Nuclear Weapons Accident: Revised Dose Evaluation Report, Vol I-III." Report for USAF, April 2001.

Odland, Lawrence T., Lt Col, USAF, MC, Robert L. Farr, Kenneth E. Blackburn, and Amon J. Clay, "Industrial Medical Experience Associated with the Palomares Nuclear Incident," *Journal of Occupational Medicine*, Vol 10 No 7 (July 1968): 356-362.