1. Keywords

EQUIP CAL 1101
RADIATION MONITORS
RADIOACTIVE MATERIALS

2. Start Date: FY 94 Quarter 2
End Date: FY 94 Quarter 2

3. HQ Division: 43 - HEALTH PHYSICS DIVISION

4. Phase:

5. Program NO:

6. Survey Type:

7. INSTALLATION OR SOURCE OF INFORMATION (CITY & STATE OR COUNTY ARE ESSENTIAL)
X8 - CECOM

8. Authors:

9. ARLOC/Activity: 34558 002 - HQ,USA ELECTRNCS CMD
Location: FORT MONMOUTH
State: NJ

10. Project Control Number: 43-E2SB-94

11. Document Type: 1

USAEHA

U.S. Army Environmental Hygiene Agency

INDUSTRIAL RADIATION SURVEY NO. 27-43-E2SB-94
U.S. ARMY COMMUNICATION AND ELECTRONICS COMMAND
AND FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY
7-10 FEBRUARY 1994

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ISB

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO
ATTENTION OF

HSHB-MR-HI (40)

3 MAY 1994

MEMORANDUM FOR Commander, U.S. Army Materiel Command, ATTN: AMCSG, 5001 Eisennower Avenue, Alexandria, VA 22333-0001

SUBJECT: Industrial Radiation Survey No. 27-43-E2SB-94, U.S. Army Communications and Electronics Command and Fort Monmouth, Fort Monmouth, NJ, 7-10 February 1994.

Copies of subject report are enclosed. Findings and recommendations were discussed at the exit briefing conducted 10 February 1994 to assist in timely correction of the deficiency noted.

FOR THE COMMANDER:

Harris Edge

HARRIS EDGE
Chief, Industrial Health Physics Branch
Health Physics Division

Encl

CF:
CDR, CECOM, ATTN: AMSEL-SF-RIR (2 CY)
CDR, AMC, ATTN: AMCSF-P
CDR, MEDCOM, ATTN: MCHO-CL-W
CDR, MEDDAC, FT MONMOUTH, ATTN: PVNTMED SVC (2 CY)
CDR, WRAMC, ATTN: PVNTMED SVC (2 CY)

DEPARTMENT OF THE ARMY
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REPLY TO ATTENTION OF

HSHB-MR-HI

3 MAY 1994

INDUSTRIAL RADIATION SURVEY NO. 27-43-E2SB-94
U.S. ARMY COMMUNICATION AND ELECTRONICS COMMAND
AND FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY
7-10 FEBRUARY 1994

1. REFERENCES. See Appendix A for a list of references.

2. AUTHORITY.

a. Memorandum, USAEHA, HSHB-M, 20 December 1993, subject: USAEHA Schedule of Field Services, FY 94.

b. Mission services planning meeting between MACOM representatives and program managers, 13-14 July 1993, USAEHA.

3. PURPOSE. This survey was performed to assist you in your efforts to use sources of ionizing radiation safely and in accordance with regulatory requirements. Specifically, this survey was performed to:

a. Alert you to any previously unknown potential health hazards or areas of noncompliance with regulatory requirements associated with the use of these sources.

b. Provide recommendations to correct any health hazards, ensure regulatory compliance, and improve your radiation protection program.

4. GENERAL.

a. An entrance interview was held with Mr. Barry Silber, Department of the Army Civilian (DAC), CECOM Safety Office; and Mr. Richard J. Lovell, DAC, CECOM Safety Office.

b. The most recent survey of the overall radiation protection program at CECOM, by this Agency, was conducted 16-20 May 1988 (Radiation Protection Survey No. 27-43-0160-88).

c. An exit briefing, to include a discussion of findings and recommendations, was held 10 February 1994 with MAJ Lee Woodliff, SC, SGS, CECOM; Mr. Steven A. Horne, DAC, Chief, CECOM Safety Office; and Mr. Lovell.

5. FINDINGS.

a. General.

(1) Mr. Horne was designated in writing as the CECOM License Manager.

(2) Mr. Joseph M. Santarsiero, DAC, was designated in writing as the CECOM Radiation Protection Officer (RPO).

(3) Mr. Lovell and CPT Constance Rosser, MS, were designated in writing as the Alternate RPOs (ARPOs).

(4) A written radiation protection program, CECOM 385-11, Ionizing Radiation Protection Program, dated 9 March 1992, was in place and appeared adequate for its intended purpose.

(5) A Radiation Control Committee (RCC) was designated in writing and was meeting on a quarterly basis.

(6) The RCC minutes indicated that the RCC reviewed the radiation exposure to date for all personnel quarterly.

(7) There was indication that the Commander, CECOM, had the opportunity to review the RCC minutes.

(8) All individuals using ionizing radiation sources had been approved by the RCC.

(9) All Nuclear Regulatory Commission (NRC) Licenses, Department of the Army (DA) authorizations, and DA permits had been approved by the RCC.

(10) All radiation workers were receiving initial and annual training on radiation protection principles and the biological effects of radiation, as well as job specific training. Female radiation workers were also briefed on biological effects to the fetus/embryo and what to do if they suspect they are pregnant.

(11) Local Standard Operating Procedures (SOPs) dealing with emergency plans for radiation incidents were posted and available for review.

b. Personnel Dosimetry Program.

(1) All personnel occupationally exposed to ionizing radiation were currently utilizing the Army Dosimetry Program.

(2) Mr. Burton C. Cummings, DA Contractor (Nuclear Support Services), was designated in writing as the custodian of the DD Forms 1952 and Automated Dosimetry Records (ADRs).

(3) All ADRs are reviewed and signed by the RPO on a quarterly basis. No errors were found in the ADRs.

(4) There are currently 37 individuals enrolled in the dosimetry program.

(5) There was no need for a bioassay program at CECOM and Fort Monmouth.

(6) All individuals had read and signed the backs of the DD Forms 1952.

(7) All personnel monitoring devices were stored only in locations approved in writing by the RPO.

(8) Procedures were in place that required non-CECOM radiation workers to notify the CECOM RPO if any exposure problems occurred with CECOM's radioactive commodities.

c. Radioactive Material.

(1) All NRC licenses and DA radiation authorizations (DARAs) were current and available for review. A complete listing of the NRC licenses and DARAs reviewed at CECOM is included as Appendix B.

(2) Radioactive material inventory was maintained by a computer tracking system for all users of CECOM managed commodities with the following considerations:

(a) The computer tracking system is verified through the use of leak tests which are sent to CECOM for analysis.

(b) Operation Desert Storm did not effect the effectiveness of the inventory control. Leak testing also continued while the sources were in the Middle East.

(c) A form is used to verify when sources arrive at end user destinations and supports the Commodity Command Standard System (CCSS) catalog control system.

(d) The CECOM and TMDE conduct physical inventory of items during their field inspections to verify the computer systems accuracy. One such inspection report identified a UDM-2 (SN: 304) at the Florida National Guard (NG), and a UDM-2 at the Illinois NG (SN: 172). Both items were correctly identified in the computer tracking system.

(3) No radioactive commodities had been disposed of since CECOM took control of their NRC licenses. Therefore, proper disposal protocols could not be verified.

(4) CECOM had coordinated its NRC license requirements with all appropriate commands, to include the Defense Logistics Agency (DLA).

(5) Evidence was available (trip report for Sacramento Army Depot, 11 May 1993) to show that CECOM conducted periodic inspections of depot stock to verify the integrity of devices containing thoriated optical coating material.

(6) The CECOM was monitoring the status of depot closures, such as Sacramento Army Depot, to ensure that their licensed radioactive commodities were being transferred to another depot or properly disposed at an NRC approved radioactive waste disposal facility. Termination radiological surveys for such facilities are outside the purview of CECOM and are being addressed by the Base Realignment and Closure Office.

(7) Contracts to order replacement stock were well written. Contractors certified that the items were manufactured IAW Army specifications. However, at the time of the survey, documentation was not available to show that audits by government personnel were conducted of production lots IAW AR 700-64, paragraph 3-4b.

(8) Numerous radioactive check sources and calibration sources were located in Building 9045. The largest individual source activity observed was 35.8 millicuries of strontium-90. The largest percentage of radioactive sources were on the order of a microcurie in activity.

(9) Building 9401 contained several radioactive sources, including two AN/UDM-1A calibration sources containing 53.6 and 57.1 curies of cesium-137 respectively, a 318 curie cesium-137 research source, and the 7,079 curie cobalt-60 pool irradiator research source. At the time of the survey no documentation was available to show that all of the Eberline, Model RMS-II area

radiation monitors had been calibrated at the appropriate interval (360 days). Additionally, the RMS-II at the door to the pool irradiator room was not source checked for the previous month and was nonfunctional. This monitor was repaired and calibrated during the course of the survey.

(10) The radioactive sources in Buildings 9045 and 9401 were properly secured. The areas were posted with the appropriate warning signs and labels. Required documents, such as safety procedures and notices to employees, were also posted.

d. Records, Reports, and Surveys.

(1) Records were available to show that leak tests were performed on all applicable sealed sources.

(2) All instrumentation used for health and safety was calibrated quarterly. Inoperative instruments were tagged and labeled as such.

(3) Reports were available to show that CECOM conducts annual inspections of depots to confirm, among other things;

(a) Independent quality surveillance using leak tests.

(b) That depot RPOs conduct leak tests of items prior to shipment.

(c) The CECOM written Radiation Safety Program is in place.

(d) The NRC required annual physical inventories are performed by the assigned depot RPO.

(4) Training records were verified for Major Command (MACOM) Radiological Control Officers (RCO), ensuring they had, at least, the minimum required training.

(5) Local users (depots and field Commanders) RPO training was identified in the computer tracking system.

(6) Compliance with new procurement requirements (First Article Testing for example) could not be verified since no new procurements have occurred since CECOM assumed responsibility for its radioactive commodities.

e. Industrial X-Ray Facilities.

(1) Several industrial x-ray machines were being used in Building 2700 and were included in the CECOM inventory as radiation producing equipment. These systems were appropriately

classified and conformed to the requirements of National Bureau of Standards (NBS) Handbooks 107, 111, and 114.

(2) Radiation warning signs and labels were properly posted. Radiation safety instructions, operational SOPs, and the most current survey performed by the RPO staff were available to the users of equipment.

(3) A Seifert 320 kilovolt peak x-ray system was located in Building 9401. The system was properly classified and conformed to the requirements of NBS Handbook 114, with exceptions as follows:

(a) At the time of the survey, a sign was not posted inside the x-ray room indicating how to de-energize the x-ray system if operation begins while personnel are inside. During the survey, the CECOM safety staff properly posted the facility.

(b) At the time of the survey, documentation was not available to show that interlock checks were being performed on the system on a consistent basis. During the survey, the CECOM safety staff amended their survey form to ensure interlock checks are documented in the future.

6. DISCUSSION.

a. The survey team was extremely impressed at the professionalism and efficiency exhibited by the CECOM radiation protection program and staff. Great effort was made to correct findings addressed or identified by the survey teams immediately.

b. With regard to paragraph 5c(6), the CECOM Safety Office records were in a transition state at the time of the survey. Therefore audits by government personnel, while stated to have been accomplished by the CECOM Safety Office, could not be verified during the survey. We suggest that copies of the audits be retained and accessible for any future reference.

c. The CECOM's management of its NRC licenses and DARAs is extremely effective and could be emulated by other Army Materiel Command (AMC) MACOM commodities programs. The overall radiation protection program is outstanding.

d. The CECOM safety staff, and especially Mr. Lovell, are to be commended for the excellent support they provided to the survey team. Their technical and administrative knowledge contributed immeasurably to the success of the survey.

7. CONCLUSION. A review of the findings indicated that:

a. There were no health hazards resulting from the use and storage of ionizing radiation sources at Fort Monmouth.

b. The management of radioactive commodities in the DA supply system controlled by CECOM and its related radiation protection program was conducted IAW regulatory requirements for radiation protection.

c. The overall radiation protection program at Fort Monmouth was being conducted IAW current directives for radiation protection, with the exception for which the following recommendations are provided.

8. RECOMMENDATIONS.

a. Ensure that documentation is utilized to support and indicate the calibration requirement for the Eberline, Model RMS-II area radiation monitors for the research sources in Building 9401 IAW, CECOM SOP Number 30-10 paragraph 6; and NRC license requirements.

b. Continue your outstanding radiation protection program management for NRC licensed radioactive materials for DOD world-wide use.

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APPENDIX A

REFERENCES

1. AR 40-5, 15 October 1990, Preventive Medicine.

2. AR 40-14, 15 March 1982, Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials.

3. AR 385-11, 1 May 1980, Ionizing Radiation Protect (Licensing, Control, Transportation, Disposal and Radiation Safety).

4. AR 700-64, April 1985, Radioactive Commodities in the DOD Supply System.

5. CECOM SOP Number 30-10, 12 January 1993, Standard Operating Procedure for the Calibration of the Eberline Model RMS-II.

6. Title 10, Code of Federal Regulations (CFR), 1 January 1993 rev., Chapter I, Nuclear Regulatory Commission.

7. NBS Handbook 107, May 1979, Radiological Safety in the Design and Operation of Particle Accelerators.

8. NBS Handbook 111, May 1978, Radiation Safety for X-Ray Diffraction and Fluorescence Analysis Equipment.

9. NBS Handbook 114, February 1975, General Safety Standard for Installations Using Non-Medical X-Ray and Sealed Gamma-Ray Sources, Energies up to 10 MeV.

APPENDIX B

NRC LICENSES AND DARAS REVIEWED AT CECOM

1. NRC Licenses.

a. BML 29-01022-06, R&D Broadscope, currently being renewed at NRC, extension granted 2 June 1992.

b. BML 29-01022-07, Irradiatior Sources, expiration date 31 October 1997.

c. BML 29-01022-10, Pool Irradiator, expiration date 31 May 1993 (extended).

d. BML 29-01022-14, Items of Supply, currently being renewed at NRC, extension granted 6 August 1992.

2. DARAs

a. A 29-10-01, Various Small Sources, expiration date 30 June 1996.

b. A 29-10-06, Radium-226 Items of Supply, expiration date 5 September 1993 (extended).

c. A 29-10-10, Electron Tubes in Supply, expiration date 31 May 1993 (extended).

d. A 29-10-12, Thorium-232 in Night Vision Systems, expiration date 31 May 1993 (extended).