~~10 CFR 2.790 INFORMATION~~

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY COMMUNICATIONS AND ELECTRONICS
MATERIEL READINESS COMMAND AND FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY 07703

DRSEL-SF-H 30 October 1979

US Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Sir:

Reference is made to a telephone conversation on 16 October 1979 between Mr. F. Costello, Radiation Specialist, US Nuclear Regulatory Commission (NRC) Region I and Mr. S. A. Horne, Health Physicist, this command, subject: Notification of Film Badge Exposure. This conversation was initiated by this command as a compliance action under US NRC Byproduct Material License Number 29-01022-08 authorizing the possession and use of the AN/UDM-2 Radiac Calibrator Set, by the Department of the Army.

As was indicated in referenced conversation, a technical investigation was conducted by Mr. B. J. Silber, Health Physicist, this command, during the week of 22 October 1979. Further, this investigation was coordinated and concurrently conducted with Mr. R. L. Woodruff of your Region II office.

This constitutes the final report of technical investigation of the film badge exposures cited below. This investigation was conducted in accordance with the requirements set forth in paragraph 20.403 of Title 10, Code of Federal Regulations, Part 20 as well as Army Regulation (AR) 40-5, Health and Environment, and AR 385-40, Accident Reporting and Records:

a. Nature of incident: Film badge exposures of [redacted] Ex 6

b. Date of event: 5 August - 2 September 1979.

c. Radiation producing sources involved:

Quantity	Nomenclature
1 each	AN/UDM-2 Radiac Calibrator Set

Information in this record was deleted
in accordanc[illegible] of Information
Act, exemptio[illegible]
FOIA- 20[illegible]

~~10 CFR 2.790 INFORMATION~~
Ex 6

II/7

d. Description of event:

(1) Wrist Badge Number 063 "E" "AYP" listed as worn by [ ] during the specified period indicated an extremity exposure of 150 Rem beta radiation. The film pattern indicates an exposure to a beam of radiation approximately 1 1/2 inches in diameter to the center of the film (Incl 1). In addition, whole body badge numbered 016 assigned [ ] during the same period indicated zero exposure.

(2) Wrist Badge Number 064 "E" "AYP" listed as worn by [ ] during the specified period indicated on extremity exposure of 70 Rem beta radiation. The film pattern indicates an exposure to a beam of radiation approximately 3/4 inch in diameter centered to the top edge of the aluminum filter (Incl 1). In addition, whole body badge numbered 107 assigned to [ ] during the same period indicated zero exposure.

(3) Wipe tests were immediately performed on 3 October 1979 on the AN/UDM-2 Radiac Calibrator Set upon determination of film badge exposure. The results were within the acceptable limits for removable contamination.

(4) Upon determination of film badge exposures, [ ] were relieved of their radiation duties.

(5) Reproduction of film badge exposures were conducted by the Chief, Nucleonics Branch and his delegated representatives who are qualified physicists with expertise in photodosimetry. Film badges were positioned within the Doserate Jig Assembly drawer and exposed by operating the Doserate Jig Assembly shutter on the 100 rad-position (Incl 1). The Doserate Jig Assembly is the TS-3494/UDM-2 portion of the AN/UDM-2 Radiac Calibrator Set. [ ] alleged exposure was reproduced by exposing the film to single exposures for approximately 80 to 100 seconds. Attempts were also made to reproduce [ ] alleged exposure by exposing film to single exposures. Results indicated that exact reproductions could not be made with single exposures. It was indicated that this exposure was definitely due to direct exposure to ^{90}Strontium/^{90}Yttrium. It is believed that reproductions could be made under multiple exposure conditions within the Doserate Jig Assembly portion of the AN/UDM-2 Radiac Calibrator Set.

(6) The Medical Officer reviewed the incident to determine need for examination, treatment and/or further medical surveillance. Blood counts were conducted, and results were within normal limits for both individuals. The Medical Officer indicated that there was no conceivable way that these exposures could be true personnel exposures (Incl 2).

(7) An inquiry was conducted and revealed that [ ] were assigned the duties of calibration and minor repairs of approximately 90 each IM-174( )/PD radiac instruments. These instruments are calibrated with the Doserate Jig Assembly portion of the AN/UDM-2 Radiac Calibrator Set. Further, these individuals indicated that they removed and placed their wrist film badges on their workbench when leaving the area during break and lunch periods. However, whole body badges were never removed during these periods.

Also, the key responsible for the operation of the Doserate Jig Assembly portion of the AN/UDM-2 Radiac Calibrator Set was never removed and secured during break and lunch periods.

(8) [ ] could not account for, and did not believe that they received, these exposures since they operated the AN/UDM-2 Radiac Calibrator Set in accordance with the training received by Nucleonics Branch personnel and that established calibration procedures were followed.

(9) [ ] reported the above information in their signed written statements (Incl 3 and 4).

(10) [ ] emphatically stated that they did not intentionally expose themselves or their film badges.

(11) Exposure history records for [ ] indicated monthly extremity exposures in the range of zero to 33 millirem gamma/x-radiation and monthly whole body exposures in the range of zero to 13 millirem gamma/x-radiation. This establishes the impossibility of receiving a 150 or 70 Rem exposure when following normal operating procedures for the AN/UDM-2 Radiac Calibrator Set.

(12) Messrs. [ ] present supervisor stated in his signed written statement that these individuals seemed to be well adjusted and cooperative and that the probability is such that they are not responsible for these exposures (Incl 5).

(13) Mr. J. M. King, Chief, Nucleonics Branch and Radiation Protection Officer, stated in his signed written statement that these exposures were of an intentional nature, that Messrs. [ ] are serious, conscientious individuals, and that these individuals appear not to have motives for intentionally exposing their film badges (Incl 6).

(14) A request for criminal investigation was placed with the Chief, Security Branch, LBDA (Incl 7) after determining that these exposures were not to the individuals but intentional exposures made to the film badges for unknown reasons and by person(s) unknown.

(15) Based upon the above determination, [ ] were returned to their normal calibration duties (Incl 8).

e. Actions taken/recommendations made to minimize impact and prevent recurrence:

(1) Strict key control for both the radioactive material storage area and the AN/UDM-2 Radiac Calibrator Set is now being maintained by the Chief, Nucleonics Branch and his delegated representatives.

(2) Control of wrist film badges are now being maintained in the office of the Chief, Nucleonics Branch.

Ex 6

DRSEL-SF-H 30 October 1979

(3) Personnel have been instructed on the proper control and security of film badges and keys used in conjunction with radiation sources.

Sincerely yours,

Steven A Hoke for

BERNARD M. SAVAIKO
Chief, Safety Office

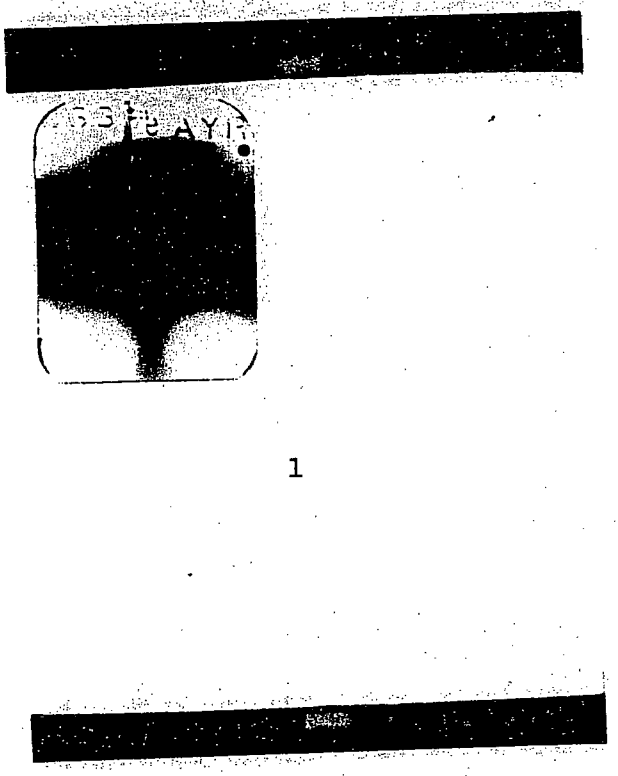
8 Inclosure
As Stated

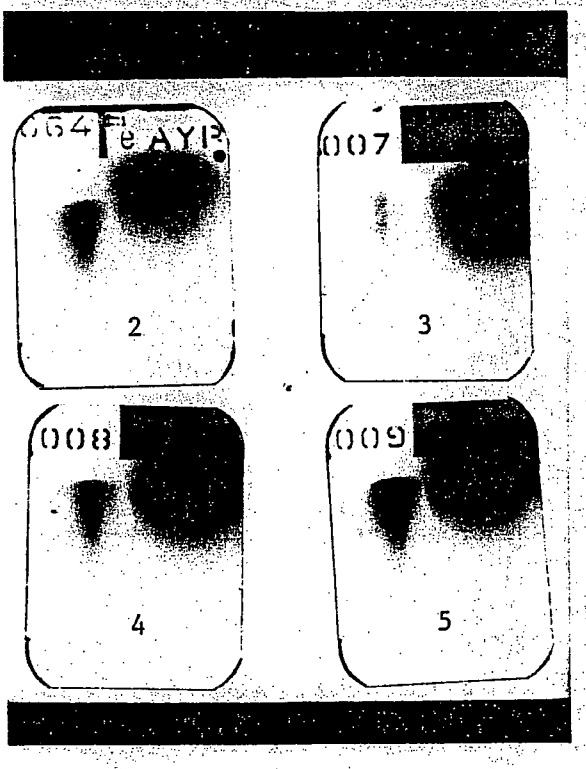
Copies Furnished:
Commander, US Army Materiel
Development and Readiness Command
ATTN: DRCSF-P
5001 Eisenhower Avenue
Alexandria, Virginia 22333 (10 Cys)

Commander
Lexington-Blue Grass Depot Activity
ATTN: SDSRR-LQN
Lexington, Kentucky 40511 (3 cys)

Mr. J.M. King, Radiation Protection Officer
Mr. A.L. Dunn, Jr.
Mr. C.E. Mattox

~~10 CFR 2.790 INFORMATION~~





1. Film assigned [redacted] 150 Rem beta radiation. Ex 6

2. Film assigned to [redacted] 70 Rem beta radiation.

3. Reproduction of radiation exposure received by film number 2 - 80 second exposure on the 100 Rad position.

4. Reproduction of radiation exposure received by film number 2 - 90 second exposure on the 100 Rad position.

5. Reproduction of radiation exposure received by film number 2 - 100 second exposure on the 100 Rad position.

Ex 6

~~10 CFR 2.790 INFORMATION~~

Incl 1

US ARMY HEALTH CLINIC
BLUE GRASS DEPOT ACTIVITY
RICHMOND, KENTUCKY 40475

ATZK-MD-DC-HCR 10 October 1979

MEMORANDUM FOR: RADIATION PROTECTION OFFICER

SUBJECT: Wrist Radiation Detector Badge Exposure of August 1979

1. The wrist radiation detectors for the month of August 1979, of two employees were noted to read 70 and 150 REM respectively. At the same time, these employees' whole body detectors read insignificant amounts.

2. In discussing the equipment used and the discrepancy between the wrist and whole body detectors it is my opinion that there is no conceivable way that this could be true personnel radiation exposure but rather exposure to the detectors only.

3. Neither of the involved employees have any complaints or symptoms and blood cell counts with white blood cell differential counts have been done (9 October 1979) and are within normal limits for both of them.

4. Dr. F. S. Gierlach, consultant for radiation problems, was contacted and concurred with above.

5. Although no damage to any personnel has occurred it is certainly felt that a thorough search for the cause of the wrist badge detector exposure should be conducted.

Forrest W. Oliverson
FORREST W. OLIVERSON
CPT, MC
Post Surgeon

Copy furnished:
Commander

Incl 2

~~10 CFR 2.790 INFORMATION~~

LEXINGTON-BLUE GRASS DEPOT ACTIVITY
LEXINGTON, KENTUCKY 40511

SDSRR-LQN

24 October 1979

MEMORANDUM FOR: To Whom It May Concern

SUBJECT: Wrist Badge Overexposure

This confirms my conversation with the Radiological Protection Officer on or about 4 October 1979. To the best of my knowledge I did not receive the wrist exposure indicated by my wrist badge during the August 1979 wearing period. I believe that the exposure was to the "wrist badge only" for the following reasons:

a. I was using the AN/UDM-2 according to instructions that I had received during training sessions on the AN/UDM-2.

b. I experienced no unusual sensations to my wrist or hand during the time I was wearing the wrist badge.

c. I was following established calibration procedures.

d. I believe that my wrist badge was intentionally exposed as explained to me by the RPO, and I do not know who made the exposure.

I further Certify that this statement is being made in good faith and that I was in no way coerced or pressured to make this statement.

[redacted]

Ex 6

Ex 6

~~10 CFR 2.790 INFORMATION~~

Incl 3

~~10 CFR 2.790 INFORMATION~~

LEXINGTON-BLUE GRASS DEPOT ACTIVITY
LEXINGTON, KENTUCKY 40511

SDSRR-LQN 24 October 1979

MEMORANDUM FOR: To Whom It May Concern

SUBJECT: Wrist Badge Overexposure

This confirms my conversation with the Radiological Protection Officer on or about 4 October 1979. To the best of my knowledge I did not receive the wrist exposure indicated by my wrist badge during the August 1979 wearing period. I believe that the exposure was to the "wrist badge only" for the following reasons:

a. I was using the AN/UDM-2 according to instructions that I had received during training sessions on the AN/UDM-2.

b. I experienced no unusual sensations to my wrist or hand during the time I was wearing the wrist badge.

c. I was following established calibration procedures.

d. I believe that my wrist badge was intentionally exposed as explained to me by the RPO, and I do not know who made the exposure.

I further Certify that this statement is being made in good faith and that I was in no way coerced or pressured to make this statement.

[redacted]

Ex 6

~~10 CFR 2.790 INFORMATION~~

Incl 4

LEXINGTON-BLUE GRASS DEPOT ACTIVITY
LEXINGTON, KENTUCKY 40511

SDSRR-LQCP 25 October 1979

MEMORANDUM FOR: To Whom it May Concern

SUBJECT: [redacted]

The subject film badges indicate collimated exposure to a nearby source of predominately beta radiation obtainable from an AN/UDM-2 only inside the IM-174 chamber irradiation drawer. Since wrist film badges are worn on the hand or wrist, and the hand or wrist can not be inserted into the drawer during exposure, these are very probably not personnel exposure.

Also since normal operation of the UDM-2 does not permit external access to such a radiation field, these exposures must be intentional and not by accident.

Both [redacted] seem to be well adjusted, cooperative individuals and since I know of no complaints from them about their use of our radiation sources, I feel the probability is greater than eighty five percent that neither of them is responsible for this film badge exposure event.

ARCH L. HOWARD
C, Primary Reference Section
Calibration Branch
Quality Assurance Division, LBDA

Ex 6

Incl 5

~~10 CFR 2.790 INFORMATION~~

LEXINGTON-BLUE GRASS DEPOT ACTIVITY
LEXINGTON, KENTUCKY 40511

SDSRR-LQN 26 October 1979

MEMORANDUM FOR: To Whom it May Concern

SUBJECT: Investigation of Wrist Badge Exposures of August 1979

1. I have reviewed wrist films number 063eAYP and 064eAYP assigned to [redacted] respectively during August 1979. The film patterns indicate that the exposures were probably caused by the beta radiation from an AN/UDM-2 Calibrator. Indications are that the wrist badges were placed inside the drawer in close proximity to the radioactive source. Both [redacted] state that they have no knowledge of how the exposure occurred. The pattern on film number 064eAYP was almost exactly duplicated by placing a wrist badge front side down inside the drawer of a UDM-2 and exposing from 80 to 100 seconds.

2. I was supervisor of Nucleonics Section, Calibration Branch, Quality Assurance Division at the time when [redacted] were selected for temporary promotion to Electronic Measurement Equipment Mechanic, WG-2614-11. I have known [redacted] for several years as a member of the depot CBR team. He has always appeared to be a serious, conscientious person and I have high confidence in his integrity. I have known [redacted] only since he has been assigned to Nucleonics in May of 1979. I have no reason to believe that [redacted] is any less person than [redacted]. Both employees seem to be happy to be assigned to Nucleonics. [redacted] permanent assignment would require him to drive an additional 60 miles each day. Neither person appears to have a motive to intentionally expose his wrist badge. The above incident has not changed my opinion of [redacted] and I would select them again to fill the positions.

Joseph M. King
JOSEPH M. KING
C, Nucleonics Branch

Ex 6

~~10 CFR 2.790 INFORMATION~~

Incl 6

~~10 CFR 2.790 INFORMATION~~

SDSRR-LQN

Request for Investigation of Film Badge Overexposure

C, Admin & Services Div
ATTN: C, Security Br

C, Qual Assur Div

9 Oct 79
Mr. King/bb/3249

1. On 4 October It became known that the wrist film badges worn by [redacted] were exposed to large amounts of radiation (150 rem & 70 rem respectively). These exposures were reported to DARCOM Safety, Office of the Surgeon General, and CERCOM Safety as required by regulation. The regulation also requires that an investigation be conducted to determine the circumstances of the exposure and requires a recommendation to prevent recurrence.

2. Film Patterns are such that it is not possible that the exposures are personnel exposures. They indicate intentional exposure of the film badges for unknown reasons. Since these exposures are deliberate, request that your office investigate the incident and that all personnel within Bldg 139 be interrogated in an effort to resolve the circumstances of the exposure. Included should be personnel from other activities on post such as COMSEC, Supply, Services and Communications who are frequently in Building 139.

for PHILIP G. JACKSON
C, Quality Assurance Division

Ex 6

~~10 CFR 2.790 INFORMATION~~

Incl 7

10 CFR 2.790 INFORMATION

SDSHR-LO7

Wrist Badge Exposure of August 1979

C, Quality Assurance Div.
ATTN: C, Calibration Br.

Radiological Protection Officer

15 Oct 79
Mr. King/bh/3249

1. It has been determined beyond reasonable doubt that the wrist badge exposures received by [redacted] were badge only and not personnel exposure. This conclusion was based appearance of film exposure patterns and on opinion of the Post Surgeon.

2. Based on above determination it is no longer necessary to isolate [redacted] from radiation work.

JOSEPH W. KING
Radiological Protection Officer

~~10 CFR 2.790 INFORMATION~~

Incl 8