DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND
2800 Powder Mill Road, Adelphi, MD 20783

*ERADCOM REGULATION
No. 385-1

1 SEP 1981.

Safety
RADIOLOGICAL PROTECTION PROGRAM

Issuance of supplements to this regulation by ERADCOM elements is permitted. Two copies of each supplement will be furnished to Commander, ERADCOM, ATTN: DRDEL-SS.

1. PURPOSE. This regulation establishes the procedures to be followed in the ERADCOM Radiation Protection Program, outlines the duties of the Command Radiation Protection Officer (RPO), the RPO at ERADCOM, Ft. Monmouth, the ERADCOM Radiation Control Committee (RCC) at Ft Monmouth, the ERADCOM Laser Safety Officer (LSO), the installation RPO and LSO and prescribes the procedures and safe work practices which must be observed by personnel engaged in operations involving radiation sources.

2. SCOPE. This regulation applies to all ERADCOM organizational units and personnel who procure, possess, use, store, transfer or dispose of ionizing and nonionizing radiation sources.

*3. POLICY. It is the ERADCOM policy to encourage the use of ionizing and nonionizing radiation sources when appropriate in the accomplishment of assigned research and development missions. It is also ERADCOM policy to utilize the least hazardous chemical and physical form consistent with mission accomplishment. Attendant with the policy is the requirement that procurement and utilization of radiation sources shall be in accordance with written procedures and shall be conducted in a fashion which will protect personnel from unwarranted radiation exposure. Programs must insure that exposures are low as reasonable achievable (ALARA). Trained personnel must be provided where radiation sources are used or operated. Failure to meet these requirements will result in cessation of operations. Compliance with federal, state, local and Army regulations will be assured governing the use, possession, transfer and disposal of radioactive material.

4. RESPONSIBILITIES.

a. The Commander, ERADCOM will--

(1) Establish a formal written Radiation Protection Program.

(2) Appoint representatives to an ERADCOM RCC as delineated in Appendix A.

(3) Appoint qualified individuals and alternates as Command RPO and ERADCOM, Ft Monmouth RPO.

(4) Appoint qualified individuals as Command LSO and ERADCOM, Ft Monmouth LSO.

*(5) Appoint in writing, qualified persons such as RPOs and ARPOs to be responsible for radioactive waste disposal at Command level as well as at the installations' level.

*(6) Assure compliance to DOT requirements in packaging, labeling and shipping of unwanted radioactive material and NRC regulations governing radioactive waste disposal.

(7) Be responsible for Command-wide training of qualified personnel in radioactive waste disposal procedures.

b. The commander or director of each ERADCOM element tenanted upon another command's installation and utilizing or possessing radiation sources will--

(1) Appoint an individual as representative to the RCC of the host to represent the ERADCOM element.

(2) Assure that the laboratory abides by the Radiation Protection Program of the host.

(3) Appoint an RPO to obtain required Nuclear Regulatory Commission (NRC) Licenses or Department of the Army (DA) Authorizations for radioactive materials unless such are provided by the host.

(4) Appoint a qualified individual as LSO if lasers are used.

*This regulation supercedes ERADCOM-R 385-1, 2 June 1980.

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[redacted]

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 6
FOIA- 2006-0238

ENCLOSURE 1

(5) Assure implementation of a Title 10 Code of Federal Regulation (CFR) Part 21 program. (Appendix B).

*(6) Assure that the laboratory abides by the Radioactive Waste Disposal Program of the host.

c. The Commander, Harry Diamond Laboratories will--

(1) Establish a formal written Ionizing and Nonionizing Radiation Protection Program.

(2) Establish an installation RCC.

(3) Appoint a qualified individual as LSO, an RPO and an alternate RPO.

(4) Assure implementation of a 10 CFR Part 21 program. (Appendix B).

*(5) Appoint in writing, qualified persons such as RPOs and ARPOs to be responsible for radioactive waste disposal.

*(6) Assure compliance to DOT requirements in packaging, labeling and shipping of unwanted radioactive material and NRC and other federal regulations governing waste disposal of radioactive material.

*(7) Be responsible for training of qualified persons in radioactive waste disposal procedures.

*(8) Maintain a library of state, federal and Army regulations governing radioactive waste disposal.

*(9) Maintain a Radioactive Waste Disposal SOP.

d. The ERADCOM Fort Monmouth RCC is responsible for--

(1) Advising the Commander, through the Command RPO, who is a member of that committee, concerning supervision and control of radiation sources and other radioactive materials.

(2) Reviewing applications for NRC Licenses and DA Authorizations.

(3) Reviewing and approving qualifications of users of radioactive sources.

(4) Reviewing reports of radiation accidents.

e. The ERADCOM Command RPO is responsible for--

(1) Staff supervision of the Radiation Protection Programs at all ERADCOM elements with authority to temporarily suspend hazardous operations.

(2) Advising the Commander on the degree of hazards associated with ionizing and nonionizing radiation, and the effectiveness of measures to control these hazards as well as periodically advising him of the general status of all ERADCOM programs.

(3) Performing evaluations of all elements to insure compliance with the provisions of NRC Licenses and applicable regulations.

(4) Maintaining the ERADCOM inventory of radiation sources and radioactive materials, including both materials licensed by NRC and those held under DA Authorizations.

(5) Coordinating the submission of applications for renewal of amendment of NRC Licenses and DA Authorizations to higher headquarters.

(6) Coordinating requests for the incorporation of radioactive materials into ERADCOM items of equipment.

(7) Reviewing equipment test results to assure that ERADCOM equipment is safe and suitable for use.

(8) Reviewing plans for radiation facilities.

(9) Maintaining a library of current publications and regulations pertinent to the ERADCOM Radiation Protection Program.

(10) Participating as a member of the ERADCOM Fort Monmouth RCC.

*(11) Assuring command-wide compliance with Army, DOT and NRC regulations governing radioactive waste disposal.

*(12) Staff supervision of radioactive waste programs of all ERADCOM elements with authority to temporarily halt shipments of radioactive waste in the event of improper packaging, labeling and shipping or other deficiency.

*(13) Performing Command reviews of activities associated with radioactive waste disposal. Maintains a record of such reviews for Army, DOT, and NRC inspections.

*(14) Including radioactive waste disposal procedures in the agenda of special interest items for all command inspections.

*(15) Furnishing summaries of findings resulting from these inspections showing number of installations/activities inspected, types and frequencies of findings, and recommendations to Commander, ARRCOM, ATTN: DRSAR-MAD-AC.

*(16) Verifying in writing, the quality assurance program of radioactive waste disposal activities established to assure that personnel, instructions, procedures and processes, and transport equipment meet safety requirements and comply with all other regulatory requirements.

*(17) Maintaining a record of all shipments and written verifications of proper shipment of radioactive waste.

*(18) Maintaining a library of current regulations pertinent to disposal of unwanted radioactive material.

*(19) Incorporating all current requirements into host element support agreements.

*(20) Coordinating and monitoring host element RPO support.

f. The ERADCOM, Fort Monmouth RPO is responsible for--

(1) Supervising the Radiation Protection Program at all Fort Monmouth, ERADCOM elements with authority to temporarily suspend hazardous operations.

(2) Advising the Commander, through the Command RPO, on the degree of hazards associated with radiation sources and the effectiveness of measures to control these hazards.

(3) Participating as the ERADCOM representative in the CERCOM RCC and chairing the ERADCOM, Fort Monmouth RCC.

(4) Maintaining a library of current regulations pertinent to the ERADCOM, Fort Monmouth Radiation Protection Program.

(5) Conducting, additionally, the tasks indicated for the Installation RPO in paragraph 4g.

*(6) Supervising Radioactive Waste Disposal Program.

*(7) Maintaining a library of all current regulations pertinent to radioactive waste disposal.

*(8) Establishing and implementing a quality assurance program of radioactive waste disposal activities to assure that personnel, instructions, procedures, and processes, and transport equipment meet safety requirements and comply with regulatory requirements. Compliance must be verified by the Command RPO.

*(9) Including all information required by paragraph 5-11, AR 385-11 in requests for disposition of radioactive waste. Such requests are made to ARRCOM, ATTN: DRSAR-MAD-AC.

*(10) Preparing the shipping document in accordance with ARRCOM instructions and providing a copy to ARRCOM for review and approval prior to shipment.

*(11) Maintaining a Radioactive Waste Disposal SOP.

g. The Installation RPO is responsible for--

(1) Providing the Commander or Director, local RCC and radiation workers with advice and assistance on all matters pertaining to radiation safety.

(2) Informing the ERADCOM Command RPO of all matters of significance which should be brought to the Command's attention. Such items would include, but are not limited to the following:

(a) Accidental overexposures or potentially serious incidents.

(b) Potentially serious or hazardous operations.

(c) Licensing violations, noncomplainces, or defects.

(d) Inspections by NRC representatives.

(3) Reviewing Standard Operation Procedures (SOP) and operations for the use of ionizing and nonionizing sources.

(4) Maintaining an accurate inventory of all ionizing and nonionizing radiation sources.

(5) Performing radiation protection surveys of all radiation sources to determine compliance with provisions of NRC Licenses and applicable regulations.

(6) Maintaining radiation protection files.

(7) Calibrating or arranging to calibrate survey instruments.

(8) Supplying the personnel monitoring devices, providing instructions in their use, and maintaining records of exposure.

(9) Monitoring shipments of radioactive materials.

(10) Supervising decontamination of materials or personnel.

(11) Monitoring storage and working areas as required.

*(12) Maintaining complete records of the receipt, transfer and disposal of radiation sources.

*(13) Maintaining records of unusual incidents such as overexposures, radioactive spills, or the loss of radioactive materials.

*(14) Arranging for radiation safety orientations and training of laboratory personnel on an annual basis to include requirements of 10 CFR Part 19 and DARCOM-R 385-25.

*(15) Preparing and submitting application for NRC Licenses and DA Authorizations.

*(16) Reviewing, updating, and amending licenses presently in effect.

*(17) Taking the following action with regard to radiation sources prior to being relieved of duties--

(a) Securing all sources in such a manner as to preclude use or removal during the period for which there is no RPO appointed; or

(b) Turning over, to a properly qualified and authorized individual, all materials and records. Such an authorized individual will have the qualifications and training required of an RPO.

*(18) Implementing a 10 CFR Part 21 Program (Appendix B).

*(19) Coordinating purchases of radioactive material to assure compliance with NRC Licenses or DA Authorizations.

*(20) Maintaining a library of all current regulations pertinent to radioactive waste disposal.

*(21) Establishing and implementing a quality assurance program of radioactive waste disposal activities to assure that personnel, instruction, procedures, processes, and transport equipment meet safety requirements and comply with regulatory requirements. Compliance will be verified by Command RPO.

*(22) Including all information required by paragraph 5-11, AR 385-11 in every request for disposition of radioactive waste. Such requests are made to ARRCOM, ATTN: DRSAR-MAD-AC.

*(23) Preparing the shipping document in accordance with ARRCOM instructions and providing a copy to ARRCOM for review and approval prior to shipment.

*(24) Maintaining a Radioactive Waste Disposal SOP.

h. The ERADCOM Command LSO is responsible for--

(1) Staff supervision of laser radiation protection programs.

(2) Performing evaluations to insure compliance with applicable regulations.

(3) Maintaining records and descriptions of all lasers in the command.

(4) Maintaining inventories and data on confirmations of exemptions on all exempted lasers in the command.

i. The ERADCOM, Fort Monmouth and Installation LSOs are responsible for--

(1) Reviewing proposals for laser operations.

(2) Insuring that protective devices used with laser operations are properly installed, evaluated for functional performance, and used in accordance with approved operating procedures.

(3) Insuring that SOP for use and operation of lasers are current and adequate and that safe procedures are complied with.

(4) Maintaining a record and description of all lasers in the installation or laboratory.

j. The ERADCOM Safety Office is responsible for providing assistance and advice on general safety matters in relation to radiation safety program.

k. Supervisors in areas where radiation sources are used are responsible for--

(1) Insuring that the RPO or LSO is consulted before any work with radiation sources begins.

(2) Insuring that all requisitions or contracts requiring radioactive material or other sources of radiation are clearly marked and that these requisitions are coordinated with the RPO or LSO as applicable.

(3) Insuring that new employees be trained in the safe handling of radiation sources to include the procedures to follow in an emergency.

*(4) Preparing prior to the start of any operation involving radiation sources, a written SOP for review and approval by the RPO and RCC. The SOP will contain, as a minimum: responsibilities, maximum permissable levels of radiation in the areas concerned, storage of radioactive materials, procedures regarding dosimetry, interlocks, decontamination, emergencies, and disposal procedures for unwanted radioactive material.

(5) Accounting for all radiation sources for which they are responsible.

(6) Posting appropriate warning signs and notices.

(7) Controlling contamination.

(8) Assuring radiation sources are secured against unauthorized use.

(9) Controlling personnel exposures.

(10) Enforcing SOP, rules, and special precautions.

(11) Reporting to the RPO any accident, ususual incident, personnel injury, or suspected overexposure immediately after occurrence.

(12) Taking the following actions with regard to all radiation sources prior to being relieved of duties--

(a) Securing all radiation sources in such a manner as to preclude use or removal while not under the immediate supervision of qualified and authorized individual; or

(b) Turning over to a properly qualified and authorized individual, all radiation sources. Such an individual will have the qualifications and training for the safe handling of the materials involved.

1. Workers in areas where radiation sources are used are responsible for--

(1) Strict compliance with approved SOP for the specific application.

(2) Using personal protective equipment properly.

(3) Reporting to the supervisor any accident, unusual incident, personnel injury, or suspected overexposure immediately after its occurrence.

APPENDIX A

MEMBERSHIP, ERADCOM, FT. MONMOUTH, RADIATION CONTROL COMMITTEE

1. ERADCOM Radiation Protection Officer at Fourt Monmouth, also serves as Chairman.
2. Commander's Representative, Fort Monmouth.
3. Commander's Representative, Headquarters, ERADCOM
4. One (1) Representative from CSTAL.
5. Two (2) Representatives from ETDL.
6. One (1) Representative from EWL.
7. One (1) Representative from TSA.

APPENDIX B

IMPLEMENTATION OF 10 CFR PART 21

1. ERADCOM organizations affected by 10 CFR Part 21 are as follows:

a. All those to which the NRC has issued the following:

(1) Byproduct Material Licenses (10 CFR Part 30 through 35).

(2) Source Material Licenses (10 CFR Part 40).

(3) Special Nuclear Material Licenses (10 CFR Part 70).

b. All ERADCOM elements packaging radioactive material for transport (10 CFR Part 71).

c. All ERADCOM elements which receive, store, use, distribute or dispose of radioactive commodities authorized by a specific NRC license.

d. All ERADCOM contracting activities involved in contracting for NRC Licensed radioactive commodities or supplies of safety-related parts, services, or consultation for NRC Licensed activities.

e. All ERADCOM organizations which evaluate radiation safety defects, hazards, or noncompliances.

2. Commanding Officer, Directors, and Chiefs of all applicable ERADCOM elements shall--

a. Implement or assure coverage under a host installation Title 10 CFR Part 21 Program.

b. Establish written procedures for ensuring notification, investigations, and reporting of suspected safety defects and/or noncompliance.

c. Make a determination of whether or not a defect or noncompliance requires reporting. Sufficient information for this determination must be supplied by the servicing RPO and a memorandum concerning the basis for this decision should be maintained in the license file.

e. Ensure through the servicing RPO or designated individual that the following items are posted in a conspicious position on the premises where NRC Licensed activities are conducted:

(1) A copy of 10 CFR Part 21.

(2) A copy of section 206 of the Energy Reorganization Act of 1974.

(3) Written procedures adopted for implementing the regulations in 10 CFR Part 21.

If posting of all three items above is not practicable, in addition to posting item (2), a notice may be posted describing the regulations/procedures including the name of the individual to whom reports may be made and stating where items (1) and (3) may be examined.

3. The Command Radiation Protection Officer (RPO) shall--

a. Provide guidance in evaluating the defect or noncompliance such that sufficient data is available for decision by responsible officers.

b. Keep the ERADCOM Commanding General informed concerning the posture of the Command Radiological Health Program to include reports of defects or noncompliance under Title 10 CFR Part 21.

4. The servicing RPO for activities utilizing licensed radioactive materials shall--

a. Implement the requirements of 10 CFR Part 21 in the form of a written document. This document should provide the RPO as the point of contact for reporting defects or items of noncompliance but should also indicate to the workers that they may report direct to NRC if they so desire.

b. Include "Responsibilities under Part 21" as a topic of discussion in annual retraining.

c. Assure posting of documents referenced in paragraph 2e.

d. Provide sufficient documentation to the responsible officer (Commanding General/Officer and those staff officers who are vested executive authority concerning NRC Licensed activities) to enable the responsible officer to make a determination regarding reporting. Notification under 10 CFR Part 21

requires first, a knowledge of a defect or a failure to comply and second, the defect or failure to comply must constitute a substantial safety hazard. If there is uncertainty as to whether the defect or failure to comply is significant, the ERADCOM Command RPO should be queried. The following constitute the criteria utilized in making a determination of the existance of a substantial safety hazard and should be addressed in this documentation.

(1) Moderate exposure to or release of licensed material.

(2) Major degradation of essential safety related equipment; or

(3) Major deficiencies involving design construction, inspection, test or use of licensed materials and facilities.

5. Supervisors are responsible for--

a. Assuring that any potential defects or items of noncompliance of which he is knowledgeable are brought to the attention of the servicing RPO, the Commander, Director, or Chief, or to the NRC.

b. Providing a climate suitable for worker reporting of potential defects or items of noncompliance without fear of reprisal.

c. Assuring posting of documents as indicated in paragraph 2e.

d. Assuring that workers are annually retrained and cognizant of the requirements of 10 CFR Part 21.

6. Workers are responsible for strict compliance with the regulations of 10 CFR Part 21 to insure notification of defects and items of noncompliance to the servicing RPO, Commanders, Directors, Chiefs, or to the NRC.

7. Contracting Officers who write contracts for purchasing radioactive commodities, supplies of safety related parts, services, or consultation for NRC Licensed facilities should insert in these contracts the following statement "Title 10 Code of Federal Regulations, Part 21 applies to this contract".

The proponent of this regulation is the Safety Office. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, ERADCOM, ATTN: DRDEL-SS, 2800 Powder Mill Road, Adelphi, MD 20783.

FOR THE COMMANDER:

OFFICIAL:

ANN S. DEWBERRY
CPT, GS
ADJUTANT

EUGENE S. LYNCH
COL, GS
Chief of Staff

DISTRIBUTION:

P

DISPOSITIO[illegible] FORM

For use of this form, see AR 340-15, the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
DRDEL-SS-H	Radiation Protection, Combined Directive

TO All Elements of
TSA
CSTAL
ETDL
EWL

FROM Cdr TSA
Cdr CSTAL
Dir ETDL
Dir EWL

DATE 15 Dec 1983 CMT 1
Renne/mnp/65292

1. POLICY

a. It is the policy of the Commander/Directors that radiation sources be used in a fashion which protect personnel from unwarranted radiation exposure and will maintain radiation exposures at a level as low as reasonably achievable.

b. Radiation sources will be used with the understanding that their procurement and utilization shall be in accordance with Radiation Safety Procedures (copy attached). Any questions concerning the interpretation of procedures will be brought to the attention of the Radiological Protection Officer (RPO) for assistance and guidance.

2. DISCUSSION

a. These procedures apply to all addressee organizational units and individuals who procure, possess, use, store, transfer, or dispose of radiation sources, i.e., radioactive material with an activity of one microcurie or greater, and ionizing radiation protection devices.

b. Responsibilities and procedures governing the radiation protection program are described in the enclosure.

3. REFERENCES

a. Code of Federal Regulations, Title 10 and 49.

b. US Nuclear Regulatory Commission Guide 8.10 September 1975 (A.L.A.R.A.)

c. AR 40-14

d. AR 385-11

e. DARCOM-R 385-25

f. DARCOM-R 385-29

g. ERADCOM-R 385-25

LEE S. REED	THOMAS E. DANIELS	MAX ADLER	CLARE THORNTON
COL, SC	Acting Dir	Acting Dir	Dir
Deputy Commander for Administration	CSTAL	EWL	ETDL

DA FORM 2496 PREVIOUS EDITIONS WILL BE USED U.S. GOVERNMENT PRINTING OFFICE: 19

ENCLOSURE 2

REQUES FOR RADIATION CONTROL COMMIT E ACTION

1. ORIGINATOR	2. DATE	3. DOCKET NO (COMMITTEE USE)
NAME _____ CODE _____	MONTH _____ DAY _____ YEAR _____	

4. REQUEST FOR APPROVAL OF

- ☐ DA Procurement (Radiation Source)
- ☐ Contractor Procurement (Radiation Source)
- ☐ Local Accelerator Produced Source
- ☐ Use on _____ Program
- ☐ Offsite Shipment
- ☐ Transfer
- ☐ Modification
- ☐ Other (Loan etc.)

Change of Custodian of Radiation Source
(Previous Custodian _____)

_____
_____
_____

5. ALL IDENTIFICATION NUMBER(S) (If Applicable)	6. NUCLIDE(S)	7. TOTAL ACTIVITY IN MILLICURIES
	Sealed Unsealed	Activity Date _____

8. DA OR CONTRACTOR PR NUMBER (Specify Contractor)	9. COMPLETE DESCRIPTION OF SOURCE (Make & Model No.)

10. PROGRAM OF USE (OR REASON FOR REQUEST) Use additional sheets if necessary

a. Program Outline

b. Methods of Control and Procedures

c. Location of Use and/or Storage

d. Method of Disposal

11. INDIVIDUAL RESPONSIBLE FOR CONTROL & ACCOUNTABILITY (Attach resume of experience with Radioactive Materials if not previously submitted to Radiation Committee)

_____ _____ USERS
_____ _____ CUSTODIAN
NAME CODE

12. REVIEWED & APPROVED (Branch Head or otherwise as appropriate)	13. RADIATION COMMITTEE
	☐ Approved ☐ Disapproved ☐ Approved subject to attached requirements
NAME _____ DATE _____	CHAIRMAN _____ DATE _____

Encl 3

RADI GICAL PERMIT APPLICATION

DATE _____

CHECK ONE
- ☐ INITIAL PERMIT APPLICATION
- ☐ APPLICATION FOR AMENDMENT TO PERMIT NO. _____
- ☐ APPLICATION FOR RENEWAL OF PERMIT NO. _____

se supplemental sheets if necessary)

1. TO:	2. ORGANIZATION APPLYING FOR PERMIT:

RADIOLOGICAL PERMIT SUPPLEMENT MUST BE FILED WITH THE HEALTH PHYSICS OFFICE FOR INDIVIDUALS NAMED IN 3 AND 4 BELOW.

3. RESPONSIBLE INVESTIGATOR	4. RADIATION AREA SUPERVISOR
NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____

5. RADIOISOTOPE(S) AND/OR OTHER SOURCES OF IONIZING RADIATION DESIRED

ELEMENT AND MASS NUMBER	CHEMICAL FORM	PHYSICAL FORM	POSSESSION LIMIT DESIRED (CURIES)

6. OPERATIONAL PERSONNEL

7. LOCATIONS WHERE SOURCE(S) OF IONIZING RADIATION WILL BE

	BLDG	ROOM OR AREA
A. USED		
B. STORED		

Encl 4

8. DESCRIBE PROCEDURE(S) IN WH. RADIOISOTOPE(S) AND/OR OTHER ICES OF IONIZING RADIATION WILL BE USED.
INCLUDE HEALTH PHYSICS PRECAUTIONS TO BE TAKEN.
ATTACH COPIES OF PERTINENT SOP AND EMERGENCY SOP TO BE POSTED.

9. RADIATION DETECTION INSTRUMENT AVAILABLE.

	TYPE OF INSTRUMENT	NUMBER ON HAND	RADIATION DETECTED	FULL RANGE	USE E.G., MONITORING SURVEYING	CALIBRATION	
						FREQUENCY	SOURCE

10. DESCRIBE LABORATORY FACILITIES AND EQUIPMENT, STORAGE CONTAINERS, SHIELDING, FUME HOODS, AND PROTECTIVE CLOTHING.

11. SIGNATURE OF DIRECTOR OR DIVISION CHIEF.

RADIOLOGICAL PERMIT APPLICATION SUPPLEMENT

NAME: _____
(Last) (First) (Middle)

Completed by HEALTH PHYSICS OFFICE	
RADIATION AREA SUPERVISOR	RESPONSIBLE INVESTIGATOR

LIST BELOW YOUR TRAINING AND EXPERIENCE WITH RADIOISOTOPES AND OTHER SOURCES OF IONIZING RADIATION (Use supplemental sheets if necessary)

1. TRAINING (To be completed by Radiation Worker, Responsible Investigator, Radiation Area Supervisor)

	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practice of radiation protection			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

2. EXPERIENCE

ISOTOPE OR OTHER SOURCE	MAXIMUM AMOUNT OR DESCRIPTION OF SOURCE	LOCATION	DURATION	TYPE OF USE

Encl 5

SUPPLEMENT J

RESUMES OF INDIVIDUALS WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL

RESUME

Dr. Ernest Potenziani, II

Telephone:
Office (201) 544-4630

Experience: 1982 To Present: US Army Electronics Technology and Devices Laboratory, Electronic Materials Research Division, Magnetic Materials Team. Responsible for installation and setup of superconducting vibrating sample magnetometer, Mössbauer Spectrometer and zero-field spin-echo NMR Spectrometer. Also responsible for interfacing the above analytical tools to this laboratory's PDP 11/34 MiniComputer.

1979-1982: Henry Krumb School of Mines, Columbia University. Responsible for installation and setup of Mössbauer Spectrometer. Also responsible for analysis, deconvolution, and interpretation of Mössbauer Spectra by computer analysis.

1976-1978: Physics Department, Rensselaer Polytechnic Institute, Troy, NY. Investigation of the isomeric states of 197 Hg as obtained from a $^{197}Au(\gamma, \pi^-)^{197}Hg$ reaction. This work involved the use of the 500 MeV Bates Linear Accelerator, Massachusetts, separation techniques, and the use of semiconductor radiation detectors.

Education: Columbia University, City of New York, NY. Master of Science, Doctor of Engineering Science, ; Major: Solid State Science and Technology.

Rensselaer Polytechnic Institute, Troy, NY. Bachelor of Science, Physics, Minor: Computer Science.

Professional Societies: IEEE, APS, AOPA.

Personal Interests:

EY/6

RESUME

NAME: Frank John Elmer 21 December 1983

BIRTHDATE: [redacted]

BIRTHPLACE: [redacted]

Ex 6

SOCIAL SECURITY NUMBER: [redacted]

EDUCATION:

Doctor of Engineering Science, [redacted] New Jersey Institute of Technology
M.S.E.E. [redacted] Monmouth College, N.J.
B.S.E.E. [redacted] Monmouth College, N.J. (Magna Cum Laude)
A.A.E.E. [redacted] Monmouth College, N.J. (Cum Laude)
1968 Manasquan High School (First High Academic Honors)

HONORS: in addition to above
Lambda Sigma Tau Most Valuable Member 1972 (Monmouth College Honor Society)
Listed in Who's Who in American Colleges and Universities 1972
Monmouth Scholar 1970-1972
Dean's List 8 consecutive semesters 1968-1972
4 year Academic Trustee Schlorship 1968-1972
Listed in Who's Who in American High Schools 1968
Bausch & Lomb Science Award 1968
Eta Kappa Nu (Electronic Engineering Honor Society)
Sigma Pi Sigma (Physics Honor Society)
National Honor Society (Manasquan High School Chapter)
Student Government Association (Senator representing Electronic Engineering Department, Monmouth College) 1971-1972

AWARDS:
Ribbon copies of my three patents
Outstanding Rating July 1975, CSTA Lab, Fort Monmouth

MEMBERSHIPS:
I.E.E.E. (Institute of Electronic and Electrical Engineers)

Additional Specialized Training:
GI License (tactical vehicles) May 1978 to present (Fort Monmouth) (M-60, M-113, etc.)
Sponsored "Optical Hazards Seminar" 28 September 1983 at EWL
Shelter Management Course 23 Jan. 1975 (Fort Monmouth)
Indoctrination Course for Career Interns 16 March 1973

PATENTS:
"Method of Determining Relative Orientation of Physical Systems", #4, 134, 618; 16 Jan 1979
"Optical Alignment Sensor", #4,035,659;12 July 1977
"Transparent Optical Power Meter", #4,019,381; 26 April 1977

Ex 6

Pending Publications:

(U) Elmer, F., "Measurement of the TOW Day Sight", Technical Report (S-NFD)

(U) Elmer, F., "Target Directional Measurement Under Optical Countermeasures", 1984 Army Science Conference, West Point, June 84 (C)

Publications:

(U) Elmer, F. "Remote Attitude Measurement Techniques". (U) DELEW-TR-82-5, Dec. 82, AD-123852 (U)

(U) Elmer, F. "Communications Effectiveness Electronic Warfare Model (CEEW)", DELEW-TR-80-3, Nov. 80, AD-B52741L (U).

(U) Elmer, F. "EW Vulnerability Issues of the Candidates for the NATO Identification System (NIS)/US Identification System (USIS)", Memorandum Report, DELEW-V, Nov. 80 (S-NFD)

(U) Elmer, F., "EW Vulnerability of the Advanced Scout Helicopter (ASH)", DELEW-TR-81-6 Sept. 81, AD-C027945L (S-NFD)

(U) D'Agostino, J., Dixon, R., Elmer, F., Rhode, R. "Gunflash Detection: Spectral/Temporal Data Base", Nov. 78, AD-C016626 (C)

(U) D'Agostino, J., Dixon, R., Elmer, F., Rhode, R. "Fourier Spectroscopy of Artillery Gunflash", June 78, AD-C014727, (C)

(U) D'Agostino, J., Dixon, R., Elmer, F., Rhode, R. "Time Resolved Gunflash Spectroscopy". 25th National IRIS, June 77, San Francisco, CA. (C)

(U) Elmer, F., Dickey,V., Patterson, W., Gauch, H. "Infrared Fence Test, Fort Sill, Oklahoma, 16, 17 September 1976", ECOM 4463, Jan 77, AD-518006 (C)

(U) Elmer, F., Hill, L., Buchmann, W., "Position and Attitude Monitor (PAM) with Application to an Airborne Flash Detection System", 7th Classified Conference on Laser Technology, West Point, N.Y. 10 June 76 (C)

(U) Carillo, A., Dehne, J., Elmer, F., "Measurements of the Muzzle Flash Radiation from the Soviet 57 Millimeter Antiaircraft Gun, Model S-60", ECOM-4253, Sept. 74 AD-531895 (C)

(U) Elmer, F. "Effects of Measurement Errors on the Accuracy of an Elevated Target Detection System", ARMCOM Meeting on Control System Design Problems, Rock Island Arsenal, Ill. 29 May 74 (U)

(U) Dickey, V., Sheehan, T., Pardes, H., Bayha, W., Elmer, F., "Artillery Location Sensor Package for the Elevated Target Acquisition System (ELTAS)", May 74 (C)

(U) Carillo, A., Dehne, J., Elmer, F., "Measurements of the Muzzle Flash Radiation from the Soviet 130 Millimeter, M-46 Field Gun" Volume 1., ECOM-4156, Sept. 73 AD-531485 (C)

(U) Carillo, A., Dehne, J., Elmer, F., "Measurement of the Muzzle Flash of the Soviet 100 Millimeter, T-55 Tank Gun", Volume 1. ECOM-4156, Sept. 73 AD-527798 (C)

(U) Carillo, A., Dehne, J., Elmer, F. "Radiometry of Soviet Artillery Muzzle Flashes" American Ordnance Association Meeting, Military Pyrotechnics Section Meeting, Picatinny Arsenal, 18-19 Oct. 72 (C)

EMPLOYMENT:

1978- Present - Electronic Warfare Laboratory, EWL, Fort Monmouth, N.J. Electronic Engineer, GS-0855-12

My present assignment is to conduct original research in areas of Electro-Optics, EO, which augment equipments currently under development and may potentially form the basis for future equipments to be fielded by EWL. While at EWL, I have been educated in the techniques of electronic warfare and applied those skills to vulnerability analyses of various US equipments, cost and operational effectiveness studies (e.g. ASH COEA), ECCM and ECM techniques (e.g. stearable null antenna processor, SNAP, and frequency hopping/spread spectrum, OCM and OCCM techniques, millimeter wave and artificial intelligence techniques and practices. I am responsible for the Wayside Laser Range in the sense that I am the primary user of that facility. Working routinely with class IV lasers, I have acquired some expertise in their use and an appreciation for their hazards.

1972-1978 - Laser Division, NVEOL and CSTA Labs, Fort Monmouth, (GS-0855-07 to 12). During this period, the Laser Division was transferred from the Combat Surveillance and Target Acquisition Laboratory, CSTA Lab, to the Night Vision and Electro-Optics Laboratory, NVEOL, (at Fort Belvoir, VA). My duties here were primarily directed at first to the measurement of gun flash for the purpose of developing a Flash Detection Sensor, FDS. This would allow hostile artillery to be located and destroyed, thus minimizing US casualties. I was heavily involved in FDS testing and development. As a result, I acquired a working knowledge of optics and radiometry. In order to increase the line of sight range of the FDS, it was proposed that it be flown on a remotely piloted vehicle RPV. (e.g. tethered helicopter). This led to my interest in remote attitude measurement which was to become the topic for my doctoral dissertation. The latest patent, #4,134,618 grew from that interest. The other two patents,#4,035,659 and 4,010,381 arose from my Masters Thesis, and are my own. While in the Laser Division, I acquired a working knowledge of various Lasers including solid state (e.g. GaAlAs), gas dynamic (e.g. CO_2), both gas discharge and RF lasers (e.g. CO_2) and flash lamp pumped lasers(e.g. NdYAG and Ruby). The transfer of the Laser Division to Fort Belvoir necessitated my reassignment to EWL.

1969-1972 Laser Division, CSTA Lab, Fort Monmouth (GS-0855-03-07)). As a student trainee, I was assigned first to work under a Mr. Sam Stein who trained me to work a 13U spectrometer which characterized the optical transmission of various samples (e.g. dyes) and detectors (e.g. HgCdTe). I then was reassigned to Mr. Carillo and Mr. Dehne who gave me a good background in not only infrared technology (ala the gunflash measurements), but also computer data reduction techniques (e.g. power spectra via fast fourier transform). Both here and while in the Laser Division, I acquired

the basics of the technical engineering skills (e.g. designing an operational amplifier circuit to "correct" the response of a measurement circuit to 005 Hz) and appreciation for their practical implementation (via DP parts) in real applications.
Prior to 1969 - I worked approximately 1 month as a stock boy in an auto parts store (Garrison's, now in Sea Girt, N.J.) and helped my father as a free-lance carpenter. Here, I acquired a basic knowledge of carpentry and mechanics along witn a good helping of common sense.

THOMAS E. DANIELS
Deputy Director
ERADCOM Combat Surveillance and Target Acquisition
Laboratory (CSTAL)
Member - Senior Executive Service

CSTAL is responsible for applied research and development in physical sciences and engineering in such broad technological areas as radar electro-optics, special sensors, and nuclear radiation detection.

CSTAL employs 200 workers which includes 125 engineers and scientists. CSTAL annual budget is approximately $60 million.

EDUCATION:

Electronics Engineer - State University of Iowa
Master of Business Administration - Monmouth College
Graduate of Industrial College of the Armed Forces

EXPERIENCE:

30 years in design, development, production and fielding of Complex electronic equipments; Systems development, integration and Compatibility of Communications equipment, electronic digital computers, electronic warfare systems, navigation systems and satellite systems.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

Who's who in the East and Who's who in Technology
Institute of Navigation
The Army Aviation Association of America
Institute of Electronic and Electrical Engineers
American Institute of Aeronautics and Astronautics
The Amierican Degense Preparedness Association

AWARDS:

2nd and 3rd highest given by the Department of Army namely, the Meritorious Civilian Service Award and the Commander's Award.

Distinguished Service Award from the University of Iowa

BIOGRAPHICAL SKETCH

Thomas E. Daniels is currently the Acting Director of the ERADCOM Combat Surveillance and Target Acquisition Laboratory (CSTAL). He is also a member of the Senior Executive Service consisting of the highest level of civilian managers in federal government service.

The Combat Surveillance and Target Acquisition Laboratory is responsible for research and development and initial production of combat surveillance target acquisition battlefield identification, radiological survey, battlefield intelligence, and meteorological systems. The laboratory is responsible for applied research and development in physical sciences and engineering in such broad technological areas as radar, electro-optics, photo optics, special sensors, and nuclear radiation detection.

He is responsible for 170 military and civilian engineers, scientists, and support personnel, and an annual budget of approximately $60 million.

He is an electronic engineering graduate of the State University of Iowa and holds a Masters Degree in Business Administration from Monmouth College. He is also a graduate of the Industrial College of the Armed Forces.

He has over thirty years of broad professional experience in design, development, production, and fielding of complex electronic equipments. He managed multi-million dollar level ($300-500 million) programs with personnel

including engineers, scientists, and military specialists (up to 50 directly and over 100 indirectly). His experience has included systems development, integration, and compatibility of communications equipment, electronic digital computers, electronic warfare systems, navigation systems, and satellite systems. He has served on high level panels, source selection boards, and study groups.

He is listed in the Who's Who in the East and Who's Who in Technology. Mr. Daniels is a member of the Institute of Navigation, the Army Aviation Association of America, Institute of Electronic and Electrical Engineers, American Institute of Aeronautics and Astronautics, and the American Defense Preparedness Association. He has previously published a number of articles and papers on air traffic control, navigation, and electronic warfare systems. He has presented papers at national and international symposia including NATO.

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Ex 6

TRAINING & EXPERIENCE WITH RADIATION & RADIOACTIVE MATERIAL
OF

Dr. Walter S. McAfee W.S. McAfee

POSITION: ECOM Commander's designated committee representative
and
Scientific Adviser to the Director of Research,
Development & Engineering and of Laboratories
US Army Electronics Command, Ft Monmouth, NJ

EDUCATION:

B.S.	Mathematics	Wiley College, [redacted]
M.S.	Physics	The Ohio State Univ, [redacted]
Ph.D.	Physics	Cornell Univ, [redacted]

Radio Astronomy, Harvard Univ, 1957-58

RADIATION TRAINING AND EXPERIENCE:

a. Dosimetry in X-ray Lab, including measurement of the roentgen by use of a free-air chamber. Also Nuclear Physics Lab. Training in safe handling of radioactive materials, evaluation of dose and dose rate, etc.

b. Worked in the nucleonics program of this Command from August 1948 into October 1953. Also planned initial radiation and calibration facilities.

RESUME OF TRAINING AND EXPERIENCE
OF DR. WALTER S. McAFEE

1. Educational Background:

BS	Mathematics	Wiley College, [redacted]
MS	Physics	Ohio State University, [redacted]
PhD	Physics	Cornell University, [redacted]
Radio Astronomy		Harvard University, [redacted]

Ex 6

2. Radiation Training and Experience:

a. Dosimetry in X-ray lab, including measurement of the roentgen by use of a free-air chamber. Also Nuclear Physics Lab. Training in safe handling of radioactive materieals, evaluation of dose and dose rate, etc.

b. Worked in the nucleonics program of the US Army Electronics Command from August 1948 into October 1953. Also planned initial radiation and calibration facilitites used at Fort Monmouth.

Ex 6

TRAINING & EXPERIENCE WITH RADIATION & RADIOACTIVE MATERIAL

OF

MR. RICHARD RAST

Ex 6

EDUCATION: BS Degree in Chemistry, Seton Hall University, [redacted]

EXPERIENCE: Biological and Clinical Chemistry, Serology and Hematology (2 yrs), Monmouth Medical Center and Patterson Army Hospital, Fort Monmouth, NJ, 1950-52.

Health Physics, Research & Development and Calibration of radiation sensitive systems; design, fabrication and encapsulation of isotopes for calibration systems up to 200 curies level, 1952-62.

During past 19 years in the Radiac R&D Group he has applied his knowledge of physics, health physics, mathematics, and electronics to the solution of engineering problems and equipment design relating to the radiac development program. Specifically, he has worked on field calibration devices, design of new portable radiac equipment, a Remote Large Area Radiac Training Set and a Recording Radiation Monitor and Automatic Radiation Alarm System, 1962-81.

Actively participated in Nuclear Weapons tests at Nevada Test Site (NTS); operations "Upshot Knothole," "Teapot," and "Small Boy." Also operations "Castle," "Redwing," and "Hardtack" at Pacific Proving Ground, Eniwetok, M.I.

Ex 6

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ACTUAL USE OF RADIOISOTOPES:

Isotope	Quantity	Place	Duration	Type of Use
^{60}Co	200 curies	Nevada	6 mos total	Equipment Calibration-Hi-range
^{60}Co	200 curies	Eniwetok	8 mos total	Dosimetry
^{60}Co	UDM-1(1-9 curies)	Evans	18 yrs (on an as needed basis)	Calibration-Dosimetry R&D
^{137}Cs	UDM-1A(120 curies)	Evans	16 yrs (on an as needed basis)	Calibration-Dosimetry R&D
^{137}Cs	Mrc 794(220 curies)	Evans	3 yrs.	Calibration Development
$^{90}Sr^{90}y$	Up to 2 Curies	Evans	12 yrs.	Calibration Development
^{60}Co	3500 curies	Evans	5 yrs.	Equipment Calibration-Hi-range Dosimetry R&D

RESUME

NAME: Scott Liggett Davis

BIRTHDATE: [redacted]

BIRTHPLACE: [redacted]

SOCIAL SECURITY NO.: [redacted]

EDUCATION:

Marshall County Senior High School
Lewisburg, Tennessee

[redacted]

Columbia State Community College
Columbia, Tennessee

[redacted]

A.S., Radiologic Technology, with Honors

University of Tennessee Center for the Health Sciences
Memphis, Tennessee

[redacted]

B.S., Radiologic Technology, with Honors

HONORS:

Graduated from Columbia State Community College - cum laude
Deans List at Columbia State Community College
Deans List at University of Tennessee Center for the Health Sciences
Professional Achievement Award - UTCHS

MILITARY SERVICE: None

BOARD CERTIFICATION:

Certified in Radiography by the American Registry, January 1979.

SOCIETY MEMBERSHIPS:

American Society of Radiologic Technologists, 1978-1981
Tennessee Society of Radiologic Technology, 1977 to present
Vice President, District 1, 1982-83

Ex 6

EMPLOYMENT:

1967-69

1969-71

1971-73

1974-75

1975-77

1977-78

1977-78 Columbia State Community College, Columbia, Tennessee. Part-time Radiologic Technologist for nursing home portables. Under the supervision of Mr. Bill Buher, the Technical Director of the Radiologic Technologist Program at CSCC.

1978-79 Wayne County Hospital, Waynesboro, Tennessee. Part-time Radiologic Technologist on call for weekends, on a rotating basis with Giles County Hospital, responsible for department from 6:00 PM, Friday until 6:00 AM, Monday. Worked with doctors and residents in Emergency Room and Radiology, under the supervision of the Chief Technologist, Carole Becallo.

1978-79 Giles County Hospital, Pulaski, Tennessee. Part-time Radiologic Technologist, Responsible for week-end call under the supervision of the Chief Technologist, Joyce Yokley.

1979 LeBonheur Children's Medical Center, Memphis, Tennessee. Staff Radiologic Technologist on Evening shift while attending school at UTCHS. Responsible for all facets of department under the supervision of the Chief Technologist, Dowtin Martin.

EMPLOYMENT, continued:

1979-80 St. Joseph Hospital (Downtown), Memphis, Tennessee. Evening Supervisor. Worked full time and attended UTCHS to obtain a B.S. degree in Radiologic Technology. Responsible for 3 technologists and 1 ancillary personnel.

1980-81 Baptist Hospital, Nashville, Tennessee. After graduating from UTCHS, I took a special procedures job at Baptist. As a special procedures technician, I was responsible for all angio work as well as most subspecialty work, such as myelograms, arteriograms, and transhepatic choleangiograms. The special work was predominantly neuro work for Doctors Hays, Bond, and Ferguson. Studies such as carotids, aortas, femorals, and some heart caths, LV. After specials, I was promoted to CT to do head work for the above mentioned physicians. Heads and bodies were done on an EMI Scanner until the purchase of the GE 8800. I had some training on this machine.

1981- LeBonheur Children's Medical Center, Memphis, Tennessee. Assistant Chief Technologist. Responsible for all of radiology and its branches, i.e., radiology, nuclear medicine, special procedures, heart caths, ultrasound, echo's, and EKG's.

Responsible for in-services, departmental meetings, staffing, scheduling, consulting at doctors meeting, quality control, and quality assurance, some coverage for special procedures, but a supervisor has been named to this area to lighten the work load. Specials and heart cath's were installed, and some design consulting done upon arrival to this institution. Ultrasound and real-time experience in head work. Some work in Nuclear Medicine so that all technicians can rotate in the department. EKG's and echo's - all techs were in-serviced on EKG's, one ultrasound technician trained to do echos on Varian 2D. I did some consulting on the echo machine. All areas of radiology are my concern, i.e., front desk, filing system, and patient information are all parts of my responsibility.

Hospital responsibilities - clinical instructor to Shelby State Community College, also, clinical instructor to St. Joseph Hospital School of Radiologic Technology - scheduling, rotating, and counselling of the students ehile they did their clinical rotations at this hospital.

Board member for LeBonheur Hospital Federal Credit Union, Officer Treasurer; Chairman of Employees Advisory Committee.

1982-83

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EMPLOYMENT, continued.

1983	LeBonheur Children's Medical Center, Memphis, Tennessee. Heart Cath. Lab Supervisor. Responsible for all aspects of heart catheterizations. Ordering of supplies, Quality Control & Assurance for both the Heart Cath Labs and Special Procedures Suite. Responsible for in-services on patient care and upgrades in technology, as well as liaison between technical staff and professional staff. Some work done in selecting and installing digital equipment.
Oct 1983 - Present	US Army Electronics Research & Development Command (ERADCOM) DRDEL-SS-H, Ft. Monmouth, New Jersey. Health Physicist - Secondary RPO for several NRC Licenses. Working in conjunction with Primary RPO on Research and Development Projects. For specific duties see enclosed copy of Amendant of Personal Qualification Statement.

NRC 313M SUPPLEMENT A — U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
Scott L. Davis	

3. CERTIFICATION

SPECIALTY BOARD (A)	CATEGORY (B)	MONTH AND YEAR CERTIFIED (C)
ARRT American Registry of Radiological Technologist	Radiology	Oct 1978

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING (A)	LOCATION AND DATE(S) OF TRAINING (B)	TYPE AND LENGTH OF TRAINING: LECTURE LABORATORY COURSES (Hours) (C)	TYPE AND LENGTH OF TRAINING: SUPERVISED LABORATORY EXPERIENCE (Hours) (D)
a. RADIATION PHYSICS AND INSTRUMENTATION	* CSCC	100	790
	* UTCHS	130	50
b. RADIATION PROTECTION	CSCC	40	40
	UTCHS	30	30
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	CSCC	50	50
	UTCHS	60	60
d. RADIATION BIOLOGY	CSCC	40	
	UTCHS	60	
e. RADIOPHARMACEUTICAL CHEMISTRY	CSCC	20	20
	UTCHS	60	60

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc 99m	25-30 mCi	CSCC/Maury Co. Hosp	1976-1978	Medical
I 131	50 mCi	" " "	" "	"
P32	10 mCi	" " "	" "	"
Ga^{67}	10 mCi	" " "	" "	"
Cs^{137}	25 mCi	" " "	" "	"
Ra^{226} (implant)	10 mCi	" " "	" "	"
Co^{60}	100 mCi	" " "	" "	"

*CSCC (Columbia State Community College)
*UTCHS(University of Tennessee Center for the Health Services)

NRC 313M SUPPLEMENT A — U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE
Scott L. Davis	

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING: LECTURE/LABORATORY COURSES (Hours) C	TYPE AND LENGTH OF TRAINING: SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION, *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc^{99m}	20 mCi	*UTCHS-LeBonheur Child Medical Ctr, Memphis, TN	1981- 1983	Medical
Ga^{67}	10 mCi	" " "	" "	Medical
In^{111}	10 mCi	" " "	" "	Medical
Co^{57}	10 mCi	" " "	" "	Medical
Co^{58}	10 mCi	" " "	" "	Medical

FORM NRC-313M Supplement A (8-78)

* UTCHS (University of Tennessee Center for the Health Sciences)

NRC FORM 313M SUPPLEMENT A

TRAINING AND EXPERIENCE
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Scott L. Davis	

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		RESIDENT LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION, *(Actual Use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Am 241	35 mCi	ERADCOM Signal Lab	1983-Present	Research & Development
Cs^{137}	400 mCi	" " "	" "	"
Co^{60}	100 mCi	" " "	" "	"
H^{3}	60 Ci	" " "	" "	"
Po 210	1 Ci	" " "	" "	"
Pm 147	1.2 Ci	" " "	" "	"
Sr 90	5 Ci	" " "	" "	"

NRC FORM 313M SUPPLEMENT A

U.S. NUCLEAR REGULATORY COMMISSION

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1 NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER	2 STATE OR PROPOSED LICENSE NUMBER AND/OR DOCKET NUMBER
Scott L. Davis	

3 CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4 TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/LABORATORY COURSES (mo.) C	SUPERVISED LABORATORY EXPERIENCE (mo.) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co^{60}	660 Ci	ERADCOM Signal Lab	1983-Present	R & D
Co^{60}	2048 Ci	" " "	" "	"
Co^{60}	125000 Ci	" " "	" "	"
U-natural or depleted	16 lbs.	" " "	" "	"
Th 232	22 lbs.	" " "	" "	"
Pu 238	50 gms	" " "	" "	"
Ra-Be	1 @ 3 mCi	" " "	" "	"

NRC FORM 313M SUPPLEMENT A — U.S. NUCLEAR REGULATORY COMMISSION

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Scott L. Davis	

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE & LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Ra-Be	1 @ 20 mCi	ERADCOM Signal Lab	1983-Present	R & D
Ra-226	1 @ 1 mCi	" " "	" "	"
Ra-226	1 @ 1 mCi	" " "	" "	"
Ra-226	1 @ 10 mCi	" " "	" "	"
Ra-226 Chk Src	10 @ 7 mCi	" " "	" "	"
Co^{57}	3 @ 50 mCi	" " "	" "	"

NRC 313M SUPPLEMENT A

U.S. NUCLEAR REGULATORY COMMISSION

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Scott L. Davis	

3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE & LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION. *(Actual use of Radioisotopes or Equivalent Experience)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Po 210	10 @ 50 mCi	ERADCOM Signal Lab	1983-Present	R & D
Pu 239	2.0 uCi to 5 mCi	" " "	" "	"
Eu 149	1 @ 50 mCi	" " "	" "	"
Pm 147	30 uCi Total 7.5 mCi	" " "	" "	"
Cs 137	1.0 mCi	" " "	" "	"

QUALIFICATIONS STATEMENT

ANTHONY S. KIRKWOOD

RADIATION PROTECTION OFFICER

EDUCATION AND TRAINING

AA (Radiologic Technology), Prince Georges Community College - [redacted]

BS Radiation Science and Administration, George Washington University - [redacted]

Registered Radiographer, American Registry of Radiologic Technologist - 1974

Registered Radiation Protection Technologist, National Registry of Radiation Protection Technologists - 1983

COURSES INVOLVING RADIATION

*	1972 - 1978	51 semester hours in formal courses pertaining to radiation, including Technical Physics, Radiation Physics and Safety, Physics of Radiologic Imaging, Directed Studies in Radiation Physics, Radiographic Techs., Clinical Radiology, Radiologic Electronics and Engineering, and Radiobiology.
*	April 1979	Respiratory Protection Course, concerning use of respirators, Goddard Space Flight Center.
*	May 1980	Radiation Safety Course, concerning liquid radioisotopes, National Institutes of Health
*	Jan-May 1981	Health Physics Certification Prep Course, with topics such as: Interactions of Radiation With Matter; Shielding; Decay; Standards; Measurements; Air Sampling; Health Physics Aspects of Reactors, Uranium Fuel Cycle, Waste Management; and Environmental Health Physics, Baltimore-Washington Chapter, Health Physics Society.
*	Feb 1982	Accelerator Health Physics, National Health Physics Society Mid-Year Topical Symposium, Orlando, Florida.
*	June 1983	Internal Dosimetry, Health Physics Society Summer School, Baltimore, Maryland.
*	Sep 1983	Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN.

Anthony S. Kirkwood, Radiation Protection Officer

EXPERIENCE WITH RADIATION

* 1972-1974 Prince Georges General Hospital, Radiography Student - training leading to registration requiring thorough knowledge of diagnostic X-ray equipment, so that such usage is accomplished safely.

* 1974-1978 George Washington University Medical Center, Sr Staff Radiographer - requiring close work with medical students and staff personnel, assisting and instructing when necessary, in safe and optimum equipment use.

* 1978-1984 NASA/Goddard Space Flight Center, Greenbelt, Maryland, Senior Health Physics Technician - responsible for initiating and carrying out programs to assure management control of numerous radioactive sources, among which are:

Kilocurie amounts of Co^{60}

Curie amounts of H^3 and Cs^{137}

Millicurie amounts of Fe^{55}, Kr^{85}, Sr^{90}, I^{125}, Po^{210}, Ra^{226}, Am^{241}, Cm^{244}, Cf^{252}

Microcurie amounts of a wide variety of other radionuclides; Accelerators; hotcells; rad waste disposal; Deuterium-Tritium neutron generators

Experience has also included:

Using sources for experimental and calibration purposes.
Leak testing and inventory of sources.
Providing surveys and monitoring for operations involving a wide variety of radiation sources.
Packaging and disposal of sources.
Evaluating radiation hazards and recommending procedures and actions to eliminate or significantly reduce unsatisfactory conditions.
Providing and evaluating personnel monitoring devices.
Setting health physics conditions for the use of radiation sources and facilities.
Evaluating health physics programs and recommending improvements.

RESUME OF TRAINING AND EXPERIENCE OF DR. STANLEY KRONENBERG

1. Educational background:

PhD in Physics, University of Vienna, [redacted]

2. Vocational experience with radiation:

1951-1952	With Institute for Radium Research, Vienna, Austria as Researcher.
1952-1953	At the General Hospital of Vienna, Austria, as Radioisotope and Nuclear Radiation researcher, medical applications.
1953-Present	With US Army Electronics Research and Development Command, Fort Monmouth, NJ, Supervisor Research Physicist

3. Formal Training in Radiation:

a. Principles and practices of radiation protection.

Where Trained	Duration of Training
University of Vienna	1948-1952

b. Radioactivity measurement, standardization, and monitoring techniques and instruments.

Where Trained	Duration of Training
University of Vienna	1948-1952

c. Mathematics and calculations basic to the use and measurement of radioactivity.

Where Trained	Duration of Training
University of Vienna	1948-1952

4. On-the-job training in radiation.

a. Principles and practices of radiation protection.

Where Trained	Duration of Training
University of Vienna	1948-1952
Institute for Radium Research	1950-1952
Vienna General Hospital	1952-1953
Fort Monmouth, NJ	1953-Present

b. Radioactivity measurement, standardization and monitoring techniques and instruments.

Where Trained	Duration of Training
University of Vienna	1948-1952
Institute for Radium Research	1950-1952
Vienna General Hospital	1952-1953
Fort Monmouth, NJ	1953-Present

c. Mathematics and calculations basic to the use and measurement of radioactivity.

Where Trained	Duration of Training
University of Vienna	1948-1952
Institute for Radium Research	1950-1952
Vienna General Hospital	1952-1953
Fort Monmouth, NJ	1953-Present

5. Experience with radioisotopes.

Isotope	Maximum Activity	Place of Experience	Duration of Experience
Radium and Derivitives	2 Ci	Inst of Radium Res, Vienna	2 yrs
^{131}I	1 Ci	Inst of Radium Res, Vienna	2 yrs
^{90}Sr	3 Ci	Inst of Radium Res, Vienna	2 yrs
^{137}Cs	220 Ci	Fort Monmouth, NJ	25 yrs
^{60}Co	125 kCi	Fort Monmouth, NJ	25 yrs
^{90}Sr	5 Ci	Fort Monmouth, NJ	25 yrs
^{210}Po	10 Ci	Fort Monmouth, NJ	25 yrs
^{241}Am	100 uCi	Fort Monmouth, NJ	25 yrs
Ra & Be neutron source	20 mCi	Fort Monmouth, NJ	25 yrs
^{239}Pu	20 lbs (fast burst reactor)	Aberdeen Proving Ground, MD	5 yrs
^{235}U	20 lbs (fast burst reactor)	Aberdeen Proving Ground, MD	5 yrs
^{85}Kr	1 Ci	Fort Monmouth, NJ	25 yrs
^{27}Na	100 mCi	Fort Monmouth, NJ	25 yrs
^{3}H	90 Ci	Fort Monmouth, NJ	25 yrs

6. Experience with devices equivalent to that of actual use of radioisotopes.

DEVICE	PLACE OF EXPERIENCE	DURATION
2 MeV Van de Graaff	Fort Monmouth, NJ	25 yrs
X-ray Machines	Fort Monmouth, NJ	25 yrs
Linear Accellerator	White Sands Missile Range	25 yrs (occassional use)
Cocroft Walton Accellerator	Edgewood Arsenal, MD	25 yrs (occassional use)
Flash X-rays (e.g. FX 100)	Fort Monmouth, NJ	25 yrs
Cyclotrons	Brookhaven National Labs	25 yrs (occassional use)
Nuclear Reactors	Oak Ridge, TN	25 yrs (occassional use)

Authored 45 scientific papers and reports in the areas of nuclear radiation, dosimetry, biology, radiation transport, tactical dosimetry, etc.

Member: American Nuclear Society

Holds 5 patents in the area of radiation dosimetry.

Served on 5 occasions as project officer at nuclear weapons tests.

TRAINING & EXPERIENCE WITH RADIATION & RADIOACTIVE MATERIAL
OF

Dr. Stanley Kronenberg

TITLE: Supv. Research Physicist

POSITION: Chief, Nuclear Hardening Technical Area
Electronics Technology & Devices Laboratory
USAECOM

EDUCATION: PhD in Physics, University of Vienna, [redacted]
Dr. Kronenberg did his doctorate in theoretical nuclear physics but participated actively during his study in the experimental work performed at the Institute for Radium Research in Vienna. After graduation he was employed by the General Hospital in Vienna to study radioisotopes in connection with medicine, therapeutic and diagnostic applications of X-rays and corpuscular rays.

Since 1953 he has been employed by the US Army Electronics Command and worked since that time with the nuclear physics group in Fort Monmouth, NJ. Research has been mainly in radiation dosimetry, nuclear effects testing, and basic research in nuclear and radiation physics.

He has published numerous papers in the above fields and holds several US patents in his area of interest. He has also participated in numerous nuclear weapon tests as project officer.

Ex 6

EXPERIENCE - Dr. Stanley Kronenberg
Chief, Nuclear Hardening Technical Area, ET7D Lab, ECOM, Ft. Monmouth, NJ

Received his education at the University of Vienna and earned his PhD in Physics in [ ] Did his doctorate in theoretical nuclear physics but participated actively during his study in the experimental work performed at the Institute for Radium Research in Vienna. After graduation he was employed by the General Hospital in Vienna to study radioisotopes in connection with medicine, therapeutic and diagnostic applications of X-rays, and corpuscular rays.

Since 1953 he has been employed by the U. S. Army Signal Corps and worked since that time with the nuclear physics group in Fort Monmouth, N. J. Did mainly research in radiation dosimetry, nuclear weapon effects testing, and basic research in nuclear and radiation physics.

Has published numerous papers in the above fields and holds several US patents in his area of interest.

Participated in numerous nuclear weapon tests as project officer.

ISOTOPE	MAX AMOUNT	PLACE	DURATION	TYPE OF USE
^{3}H	100 Ci	ECOM	1960	Sources assembly
^{22}Na	Several milicuries	ECOM	1962	Research
32 p	Tracer	ECOM	1953 - present	Dosimetry
^{60}Co	3500 Ci	" & Vienna	1951, 1960 -pres.	Research
^{85}Kr	1 Ci	ECOM	1963	Research
Ag	Tracer	ECOM	1955-present	Dosimetry
^{90}Sr	1 Ci	ECOM & Vienna	1950, 1958	Dosimetry
^{198}Au	Tracer	ECOM	1955-present	Dosimetry
^{137}Cs	150 Ci	ECOM	1958-present	Research
Th (Various Isotopes)	several kg	ECOM	1970-present	Research
^{235}U	several Kg	ECOM	1958-present	Use of Burnt react in Research
Pu	several Kg	ECOM	1958-present	Use of Burnt react and Atom bombs

Ex 6

RESUME

DAVID W. GRIFFIS

PERSONAL:

Born: [redacted]
Martial Status:
Health:
Military Service: Captain, Medical Service Corps,
Unites States Army
October 1978 - July 1982
Present Position: Radiation Protection Officer,
Safety Office
HQ, US Army Electronics Research and
Development Command

EDUCATION:

Texas A&M University, College Station, Texas
Degree: MS, Nuclear Engineering - [redacted]
Thesis: Computer Determination of Bacterial Volume

Degree: BS, Nuclear Engineering - [redacted]

Texas Tech University, Lubbock, Texas
Degree: BS, Chemistry - [redacted]

San Antonio Junior College, San Antonio, Texas
Degree: AS - [redacted]

WORK EXPERIENCE:

July 1983 to Present — Radiation Protection Officer, Safety Office, HQ, USA ERADCOM

This job includes on site visits to ERADCOM laboratories and activities to insure compliance with DOD and other Governmental agency directives concerning ionizing and nonionizing radiation safety. The job also includes the responsibility to review and comment on various documents including equipment and facility designs, proposed regulations, and environmental assessments. It is usually necessary to prepare oral and written reports of the findings of these visits and documentation reviews. Additionally, the job includes responsibilities to coordinate various inspections, audits, surveys, or studies performed by other DoD or non-military governmental agencies and prepare responses which may be generated by various recommendations prepared by these agencies. Other duties include preparing training requirements for the Health Physics staff of ERADCOM and keeping various safety statistics.

Exhibit

Work Experience Continued:

November 1981 to July 1982 — Nuclear Medical Science Officer; Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland

This job included on-site visits to various Department of Defense (DoD) installations to insure compliance with DoD and other governmental agency directives concerning radiation safety. The job also included the requirement to review and comment on various documents including facility designs, proposed installation regulations and environmental assessments. It was usually necessary to prepare oral and written reports of the findings of the on-site visits and document reviews. There was also a requirement to prepare and present lectures during various short courses presented by the division as well as act as an assistant supply officer for the division (approximately 20 persons).

January 1979 to November 1981 — Nuclear Medical Science Officer, Laser-Microwave Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland

This job included on-site visits to various DoD and other governmental agencies' installations to insure compliance with DoD or other directives concerning the safe use of lasers or other high intensity optical sources. Often the job required the evaluation of newly developed systems which used laser devices to insure that the laser would be safe to use during training or repair of the laser device. It was usually necessary to prepare oral and written reports of the findings of the on-site visits and device evaluations. There was also a requirement to prepare and present lectures during various short courses presented by the division. Other duties included scheduling the quarterly and yearly on-site visits for a branch of approximately 10 persons, and preparing job description statements required for the hiring of technicians.

PART TIME EMPLOYMENT:

August 1977 to September 1968 — Fort Sam Houston Independent School District, Fort Sam Houston, Texas

and

August 1982 to June 1983 — Substitute teacher for various science and mathematic courses. Class size varied - up to 25 persons.

August 1975 to May 1977 — Department of Mathematics, Texas A&M U, College Sta, Texas. Instructor of entry level mathematics course. Number and size of classes varied from 40 to 150 persons.

Part Time Employment continued

August 1972 to May 1973 — Department of Chemistry, Texas Tech University, Lubbock, Texas

Responsible for preparing chemicals and replacing broken laboratory utensils for laboratory (10 labs/week). (One of approximately 20 individuals with this job).

August 1970 to May 1971 — Department of Chemistry, San Antonio Junior College, San Antonio, Texas

Responsible for preparing chemicals and replacing broken laboratory utensils for laboratories (5 labs/week). (One of three individuals with this job).

MISCELLANEOUS:

Member of:

DARCOM Radiation Advisory Group
DoD Laser Safety Working Group
Health Physics Society

Military Courses Completed:

Army Medical Department Radiation Protection Officer Workshop	- 1982
Nuclear Hazards Training Course	- 1980
Medical X-Ray Survey Techniques	- 1979
Laser and Microwave Hazard Analysis	- 1979
Lasers	- 1979
Army Medical Department Officer Basic Course	- 1978

Other Courses Completed:

Radiation Emergency Management	- 1984
Health Physics Aspects of Depleted Uranium	- 1984