



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY  
UNITED STATES ARMY AVIATION AND MISSILE COMMAND  
5300 MARTIN ROAD  
REDSTONE ARSENAL AL 35898-5000**

Safety Office

P-7

Attention: Mr Thomas Thompson  
U.S. Nuclear Regulatory Commission, Region I  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

01-25316-01 03033658

MS-16

Dear Mr. Thompson,

Thank you for your continued and helpful assistance on our application for renewal of NRC License 01-25316-01. We appreciate your guidance.

Enclosed please find both your email dated October 3, 2005 and our responses to the items for which you have requested further information.

Questions concerning this action should be directed to Keith Rose, (256) 313-2114, Fax (256) 313-2111 or email [keith.rose@redstone.army.mil](mailto:keith.rose@redstone.army.mil).

Sincerely,

*Arthur Keith Rose*  
Arthur Keith Rose, CHP  
AMCOM RSO

**AMCOM RESPONSE TO THOMAS THOMPSON EMAIL, OCTOBER 3, 2005****Regarding****NRC LICENSE RENEWAL – LICENSE NO. 01-25316-01  
MAIL CONTROL NO. 136222**

1) Please identify the individual who will be the Radiation Safety Officer (RSO) for the license and provide their training unless already provided. It is not NRC policy to list alternate RSO's on the NRC license. Duties of the RSO may be delegated to an alternate but not the responsibility.

**ITEM 1 RESPONSE)** Keith Rose, AMCOM RSO, will be the Radiation Safety Officer. We are withdrawing the request that an Alternate RSO be listed. Training is already provided in Supplement 7.0, Item 7.2 of the license application and also enclosed as Attachment 1.

2) Please note that because you are now requesting a limited scope license you should indicate who are the authorized users and submit their training and experience for NRC review. If authorized they will be listed by name on the license. Authorized users are those individuals who will supervise use of byproduct materials. Please review NRC guidance document NUREG 1556, Vol. 7, Item 8.7.2 and provide the information indicated as "Response from Applicant". Current NRC regulations and guidance are included on the NRC's website at [www.nrc.gov](http://www.nrc.gov); select Nuclear Materials; Medical, industrial, and academic uses of nuclear material; then toolkit index page.

**ITEM 2 RESPONSE)** Name of each authorized user: Arthur Keith Rose, CHP, Jean C. Moore, NRRPT, and Robert Thompson, MSIC/DIA RSO. Information demonstrating qualification by training and experience is provided on Attachments 1, 2, and 3.

3) A byproduct materials storage location indicated in your August 24, 2005 letter is Redstone Arsenal Radioactive Materials Storage Area, Bldg. [REDACTED], Bay [REDACTED]. This location is not listed on your current license in Condition 10. Please clarify where the areas of use and storage of byproduct materials will be and provide the information indicated as "Response from Applicant" in NUREG 1556, Vol. 7, Item 8.9.

**ITEM 3 RESPONSE)** The Redstone Arsenal Radioactive Material Storage Area (RMSA) in Building [REDACTED], Bay [REDACTED] on Sweetleaf Rd., Redstone Arsenal where the items or devices are immediately stored was not in existence at the time of the original license application. It was chosen as the RMSA 30 September 2003 due to its remote location and availability. Other storage items located there include various radioactive Army commodities and generally licensed items with sealed sources awaiting disposal. There are no unsealed sources or loose contamination and the area is surveyed for radiation and contamination quarterly and whenever new items are placed there. Radiation and contamination surveys of immediate adjoining unrestricted areas are performed concurrently to assure radiation exposure to members of the public is kept well below

NRC limits. The area is well-lighted with metal halide lighting. The walls are made of brick which was manufactured locally by German POWs during WWII. The building is built on a concrete slab. There is no ventilation or running water or plumbing at this facility. Anyone working with radioactive materials in the RMSA monitors themselves upon leaving with a thin window GM survey instrument. Should the need arise, Radiac Wipes<sup>®</sup>, or equivalent, are kept on hand for decontamination. A scaled sketch of Building [REDACTED] the RMSA and the last survey of the RMSA are enclosed as Attachments 4, 5, and 6.

Building [REDACTED] Fowler Rd., at the MSIC/DIA compound is normally used for the removal of devices from foreign military vehicles. A radiation and contamination survey is performed prior to removal and the item is immediately (normally within the same day) transferred by government vehicle by the MSIC/DIA RSO or the AMCOM RSO or alternate to the RMSA at Bldg. [REDACTED] Bay [REDACTED]. A scaled sketch of Bldg. [REDACTED] is enclosed as Attachment 7.

A map of Redstone Arsenal with the two buildings' locations is enclosed as Attachment 8.

4) Please provide additional details on your survey and wipe test procedures. You may provide the information indicated as "Response from Applicant" in NUREG 1556, Vol. 7, Item 8.10.7.

**ITEM 4 RESPONSE)** We will survey our facility and maintain contamination levels in accordance with the survey frequencies and contamination levels published in Appendix Q to NUREG-1556, Vol. 7, 'Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope,' dated December 1999. Leak tests will be performed at the intervals approved by NRC or an Agreement State and specified in the SSD Registration Certificate. Leak tests will be performed by an organization authorized by NRC or an Agreement State to provide leak testing services to other licensees or using a leak test kit supplied by an organization authorized by NRC or an Agreement State to provide leak test kits to other licensees and according to the sealed source or plated foil manufacturer's (distributor's) and kit suppliers instructions. As an alternative, we will implement the model leak test program published in Appendix R to NUREG-1556, Vol. 7, "Consolidated Guidance about Material Licenses: 'Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope,' dated December 1999.

5) Please provide additional details on your instrument calibration procedures. You may provide the information indicated as "Response from Applicant" in NUREG 1556, Vol. 7, Item 8.10.2.

**ITEM 5 RESPONSE)** The specific instruments used for radiation and contamination surveys under this license are:

Eberline	ASP-1	Alpha
Victoreen	190	Alpha/Beta/Gamma
Exploranium	135	Alpha/Beta/Gamma/Isotope Identification
Ludlum 19	Micro-R	Gamma
Eberline	E 520	Beta/Gamma
Eberline	E 600	Beta/Gamma
Eberline	RO 20	Beta/Gamma
Victoreen	450-P	Gamma
Victoreen/Inovision	451-B	Beta/Gamma
Ludlum scaler	2000	Beta/Gamma

We will use instruments that meet the radiation monitoring instrument specifications published in Appendix M to NUREG-1556, Vol. 7, "Consolidated Guidance about Material Licenses: 'Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope,' dated December 1999. We reserve the right to upgrade our survey instruments as necessary.

6) Please provide additional details on your source accountability procedures. You may provide the information indicated as "Response from Applicant" in NUREG 1556, Vol. 7, Item 8.10.3.

**ITEM 6 RESPONSE)** Physical inventories will be conducted by the AMCOM RSO or alternate at intervals not to exceed six months to account for all sealed sources and devices received and possessed under the license. Results will be sent by memo to the MSIC/DIA RSO for comparison to his inventory. Discrepancies will be investigated and resolved.

7) In your renewal request you had indicated that byproduct materials that you would obtain should be listed on the license as sealed sources. NRC's regulations in 10 CFR 30.32(g) indicates that applicants for the use of sealed sources must either identify the source or device by manufacturer and model number as registered with the NRC under 10 CFR 32.210 or provide the information identified in 10 CFR 32.210 (c). From the information you have provided apparently the listed sealed sources would not normally be registered. You may request an exemption from 10 CFR 30.32 (g) as is indicated in 10 CFR 30.11. If you are requesting an exemption please include your basis for the request. Alternatively you may request these sources be list as "any" form

in which case financial assurance would need to be provided. Useful guidance for providing acceptable FA is contained within NRC's website as Draft Guide 3014 (DG-3014).

**ITEM 7 RESPONSE)** The MSIC/DIA would like to apply for an exemption from the requirements of 10 CFR 30.32 under the provision of 10 CFR 30.11. Specifically the MSIC/DIA would like an exemption from the requirements to list the sealed sources on NRC Form 313 Item 5 by their manufacturer and model number as registered under the NRC under 10 CFR 30.201. The reason for this exemption request is that the sole purpose of this license is to be able to remove and store for disposal devices containing sealed sources of foreign manufacture which may be contained on or in foreign military vehicles or conveyances. It is not possible for these sources to be registered with the NRC by manufacturer and model number. Typically these sources are contained in devices such as chemical agent alarms or detectors that are installed on foreign military vehicles. It is not known to the licensee what sources or devices they may receive until the foreign vehicles arrive at the MSIC/DIA compound located on Redstone Arsenal adjacent to Huntsville AL. The vehicles are immediately surveyed by the MSIC/DIA RSO for radioactive material. If found, the device(s) are removed, surveyed for radiation and contamination and transported by government vehicle to the Redstone Arsenal Radioactive Material Storage Area (RMSA) where they are resurveyed, to include leak test, by the AMCOM RSO or alternate and placed in storage for future disposal by the U.S. Army Field Services Command. In the interest of national security and DOD policy, methods, sources or origination of foreign equipment cannot be revealed. Unsealed sources will not be received under this license.

8) In your original renewal request for a broad scope license you had asked for authorization for additional byproduct and special nuclear materials which is broader than usually included in a limited scope program. Because you are now requesting a limited scope program, please review these items for any changes.

**ITEM 8 RESPONSE)** We have reviewed our request for additional byproduct and special nuclear materials that are broader than those usually included in a limited scope program.

We would like to change the amount of Pu-239 requested, 50 grams, to 50 milligrams, as listed on the original license application. This was a typo that was not caught after the final typing. Devices containing Pu-239 under this license typically range from 185-260  $\mu\text{g}$  (16.38  $\mu\text{Ci}$  each).

We would like to replace Supplement 5.0 (NRC Form 313, Item 5) with the following:

## RADIOACTIVE MATERIAL

ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER	MAXIMUM AMOUNT WHICH WILL BE POSSESSED AT ANY ONE TIME
Hydrogen 3	Sealed in Glass Ampoules	NA	500 curies total
Cobalt 60	Sealed Sources	NA	10 millicuries total
Nickel 63	Foils, Plated Sources or Sealed Sources	NA	1 curie total
Krypton 85	Sealed Sources	NA	1 curie total
Strontium 90	Sealed Sources	NA	100 millicuries total
Cesium 137	Sealed Sources	NA	100 millicuries total
Promethium 147	Sealed Sources	NA	1 curie total
Americium 241	Foils, Plated Sources, or Sealed Sources	NA	10 millicuries
Special Nuclear Material	Sealed Sources Metal or Plated Metal	NA	50 milligrams total

\*\*Receipt of material exceeding these limits will require immediate notification of the NRC and filing of a license amendment

**Arthur K. Rose, CHP  
Health Physicist**

**U.S. Army Aviation and Missile Command  
Redstone Arsenal, AL 35898-5000**

**Commercial 256-313-2114  
DSN 897-2114**

**1. Education:**

- a. University of North Alabama, Florence, AL, December [REDACTED] Degree: B.S. Major: Biology  
Minor: Chemistry
- b. Georgia Institute of Technology, Atlanta, GA, 1986 Biology 6730, "Biological Effects of  
Radiation"

**2. Professional Experience:**

- a. May 1998 to present, U.S. Army Aviation and Missile Command (AMCOM), Health  
Physicist.

Serves as AMCOM Radiation Safety Officer to implement the AMCOM Radiation Safety Program in support of Redstone Arsenal installation and subordinate activity operations for the use of radioactive materials, radioactive commodities, radiation-producing devices, lasers, and radiofrequency radiation sources used in aviation and missile systems. Provides technical assistance to AMCOM and PEO, Aviation systems on ionizing and nonionizing (lasers, microwaves, etc.) radiation issues. Establishes and maintains safe practices and standards for design, development, production, movement, storage, use, and maintenance of radioactive materials/devices used in research and development activities and for materiel intended for incorporation into the Army inventory. Advises the commander on issues relating to the control of hazards associated with the use of ionizing and nonionizing radiation sources.

- b. March 1991 to May 1998, U.S. Army Test, Measurement, and Diagnostic Equipment Activity (USATA), Physicist.

Served as Project Leader and Technical Expert in Physics. Included research, design, development, and application of technology needed to advance state-of-the-art calibration standards and test measurement and diagnostic equipment. Responsible for procurement of Health Physics-related standards and equipment such as Bicron Extremity Dosimetry System, Counting Lab Equipment, Survey Meters, Liquid Scintillation Standards, Beta/gamma Sources, Computer Controllers, and Glow Curve Interface Boards. Also responsible for the testing and acceptance of Health Physics-related standards and equipment.

c. September 1989 to March 1991, U.S. Army Test, Measurement, and Diagnostic Equipment Activity (USATA), Health Physicist.

Served as Alternate Radiation Control Officer for the U.S. Army Test, Measurement, and Diagnostic Equipment Activity. Responsibilities included managing and operating the USATA Radiation Protection Program worldwide. Provided technical support to the Army Primary Nucleonic Calibration Program, the worldwide Army RADIAC Program, and the Army Ionizing Dosimetry Program. Ensured that each radiological operation within the U.S. Army TMDE Support Activity had an adequate radiation safety program, proper safety equipment, and a facility that met the required radiation safety standards for its assigned mission. Served as the Alternate Radiation Protection Officer for the U.S. Army Primary Nucleonics Laboratory. Served as a consultant and advised radiation protection personnel on matters involving health physics, radioactive material disposal, and environmental radiological monitoring. Provided training to radioactive material users and ancillary personnel.

d. February 1985 to September 1989, Tennessee Valley Authority, Muscle Shoals, AL, Health Physicist.

Directed health physics activities at TVA's Power Service Shops. Responsibilities included participating in the planning of activities to incorporate good radiation protection practices and to ensure exposures were maintained as low as reasonably achievable, acquiring and supervising technicians, training technicians and workers, preparing radioactive shipments, performing calibration checks on instrumentation, changing out Thermal Luminescent Dosimeters (TLDs), performing surveys, providing health physics coverage to workers, and maintaining QA records of activities.

Provided support to by-product material license holders within Nuclear Power (approximately 15 licenses). Support included assistance in preparing application for license and/or license amendments, interpretation of license requirements, and supervision and conduct of direct health physics support.

Conducted inspections of licensed activities (including incident investigations/reports). Developed, wrote, and reviewed for technical accuracy procedures which directed the health physics activities supporting by-product license holders. Provided health physics training to radioactive material users.

Coordinated the personnel dosimetry program with license holders. Investigated lost or damaged TLDs and assigned dose based on investigation. Served as a Radiological Emergency Plan field team member during plant emergency exercises; assisted in the maintenance of emergency equipment.

Served as a member of TVA's Health Physics Instrument Committee from April 1984 to November 1987. As a member, conducted evaluations of various instruments and made recommendations to the committee. Operated TVA's whole body counter from December 1986 to September 1988. Assigned briefly as Plant Health Physicist at Bellefonte Nuclear Plant.

e. April 1984 to February 1985, Tennessee Valley Authority, Muscle Shoals, AL, Health Physics Technician.

Conducted/directed health physics surveys at TVA facilities that use radioactive materials or radioactive producing equipment. Coordinated these surveys with the appropriate supervisors in the various divisions. Made recommendations for corrective actions if necessary. Secured accurate and adequate field data and prepared reports and survey memoranda. Provided training to paramedical personnel on general health physics and handling of contaminated patients from nuclear plants. Interpreted and applied regulations regarding transportation of radioactive materials and use of medical X-rays. Served as a member of the radiological emergency response team.

f. January 1983 to April 1984, Tennessee Valley Authority, Browns Ferry Nuclear Plant, Decatur, AL, Health Physics Training Instructor.

Conducted 2-day training program for new personnel, 4-hour retraining for persons requiring reorientation, and presented special training if needed. Conducted 40-hour training programs for senior contract health physics technicians and technician aids. Scheduled training classes with a minimum of conflict with plant work requirements. Developed lesson plans and exams to meet Institute of Nuclear Power Operations (INPO) approved format.

g. April 1982 to January 1983, Tennessee Valley Authority, Muscle Shoals, AL, Health Physicist.

Conducted training for TVA's 2-month preparatory class and 6-month health physics technician training class. Delivered lectures involving nuclear physics, college-level mathematical calculations, etc. Provided specialized training in specific areas of health physics such as BWR and PWR plant systems. Assisted in the procurement of supplies and health physics laboratory equipment. Acted as liaison between training section and the nuclear power plants to determine their health physics training needs. Developed lesson plans and exams to meet INPO approved format.

Results: Graduated 22 well-trained health physics technician trainees for two operating nuclear plants. Received excellent service review.

h. December 1979 to April 1982, Tennessee Valley Authority, Browns Ferry Nuclear Plant, Decatur AL, Health Physics Technician.

Served as shift coordinator. As shift coordinator was responsible for scheduling and assigning routine and special radiation and contamination surveys and issuing special work permits. Worked in the plant lab and all outage control points during major outages.

**3. Certification:** Certified by the American Board of Health Physics, November 2002.

**4. Formal Training in Radiation Protection Methods, Measurements, and Effects**

a. TVA Health Physics Technician Training Course (6-month Health Physics Technician Training Course involving nuclear physics, instrumentation, and plant systems.)

b. TVA Radioactive Material Shipment Workshop.

Attachment 1  
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- c. Regulatory Compliance Workshop (Nuclear Energy Waste Management Consultants)
- d. TVA REP Training, Environmental Monitoring Van.
- e. TVA Mobile Whole Body Counter System Course.
- f. TVA Health Physics Technician Continuing Education (40 hours).
- g. TVA Moisture-Density Gauge Training.
- h. U.S. Army Method of Instruction (40 hours).

#### 5. Experience with Radioactive Materials:

	<u>Isotope</u>	<u>Maximum Activity</u>	<u>Duration of Experience</u>		<u>Type of Use</u>
a.	Cs-137	200 Ci	1 year	6 months	For items a-i calibration of instrumentation
b.	Cs-137	2 Ci	1 year	6 months	
c.	Co-60	50 Ci	1 year	6 months	
d.	Co-60	0.5 Ci	1 year	6 months	
e.	Sr-90	180 mCi	1 year	6 months	
f.	Cs-137	100 Ci	1 year	6 months	
g.	Pu-239	2 $\mu$ Ci	1 year	6 months	
h.	Co-60	55 mCi	1 year	6 months	
i.	Cs-137	1400 Ci	5 years		
j.	Ir-192	10 to 100 Ci	5 years		Radiography

Attachment 2  
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**Jean C. Moore**  
**Health Physicist**  
**Contractor, SAIC (Science Applications International Corporation)**

**U.S. Army Aviation and Missile Command**  
**Redstone Arsenal, AL 35898-5000**

**Commercial 256-876-7272**  
**DSN 746-7272**

**1. Education:**

- a. University of Alabama, Tuscaloosa, AL, May [REDACTED] Degree: B.S. Biology
- b. National Registry of Radiation Protection Technologists (NRRPT) 1991 and re-certified in 2002.
- c. Illinois Institute of Technology, Chicago IL, 2002 "Health Physics I" and "Standards, Statutes and Regulations".

**2. Professional Experience:**

- a. June 2001 to present, Senior Engineer/Scientist, Health Physicist, SAIC, Huntsville AL

Provide support and assistance to Radiation Safety Officer, U.S. Army Aviation and Missile Command (AMCOM) Redstone Arsenal, AL in all aspects of managing the Ionizing and Non-Ionizing Radiation Safety Program. Specifically, prepare training materials and teach radiological safety officer classes, write or revise Department of the Army radiological safety procedures (AMCOM R 11-1 Radiation Safety Program), maintain safe standards for design, development, production, movement, storage, use, and maintenance of radioactive materiel and devices used in research and development activities, and for materiel intended for incorporation into the Army inventory. Evaluate potentially hazardous operations involving ionizing and non-ionizing sources and, based on analyses, develop appropriate life cycle safety procedures. Review and assess the adequacy of design for a modification of radiological facilities, perform radiation protection surveys on modified industrial radiographic facilities before placing new equipment into operation. Survey Army commodities containing radioactive material for turn-in or shipment. Perform activity inspections and provide support for facilities on Redstone Arsenal that utilize radiation sources. Respond to and investigate incidents involving radioactive material and write reports. Perform activities in support of U.S. Nuclear Regulatory Commission Licenses held by AMCOM, to include maintenance of records required by such licenses, provide training materials to license users, and expedite compliance with license requirements. Design database to ensure AMCOM Safety Office radiation survey instruments are calibrated on schedule. Evaluate new training material and checklists submitted by Army Materiel Command (AMC). Participate in AMC inspections of AMCOM Radiation Safety Program, generate response to recommendations, and implement responses. Organize annual Radiation Safety Committee meetings, prepare and distribute minutes to attendees. Perform specialized research on topics of radiation safety for Chief, AMCOM Safety Office. Review and maintain personnel dosimetry records, issue personnel dosimetry, ensure Form

5s are delivered to all Radiation Workers under AMCOM Safety Office. Perform all duties of AMCOM Radiation Safety Officer during his absences.

b. September 2000 to February 2001, Quality Engineer, Federal Mogul Sealing Systems, Athens, AL

Responsible for customer quality concerns, internal quality education, statistical process control. Writing, revision and distribution of Quality Instructions. Internal quality audits and preparation for semi-annual QS-9000 audits.

c. March 1998 to August 2000, Materials Technician, Materials Engineering Lab, Federal Mogul Sealing Systems, Athens, AL

Physical and chemical testing of all gasket materials using standard lab test instruments (Instron, MTS, etc.) for product engineers at corporate headquarters and generation of Material Engineering reports.

d. July 1987 to October 1996, ANSI 3.1 Senior Radiological Control Technician, Tennessee Valley Authority, Browns Ferry Nuclear Plant

Provided radiological coverage for various work activities throughout plant at all control points encompassing radiation and contamination protection measures, acted as coordinator at all control points directing work activities of other RADCON technicians. Monitored radiation and contamination to include skilled use of various measurement and monitoring equipment, maintenance of proper records and documentation. Special Assignments: Review, revise and/or rewrite RADCON procedures to comply with all governing regulations, standards, specifications, and guidelines. Reviewed RADCON Quality Assurance records for accuracy and completeness and maintained QA documents in accordance with plant Technical Specifications.

e. October 1985 to July 1987, RADCON SE-4 Technician, Tennessee Valley Authority, Browns Ferry Nuclear Plant

On-the-job training phase of TVA's radiological control training program. Functioned as junior RADCON technician at all control points. Curriculum available upon request.

f. July 1985 to October 1985, RADCON SE-3 Technician, TVA Power Operations Training Center, Chattanooga, TN

Classroom phase of TVA's radiological control training program. Ranked 3<sup>rd</sup> in class with a 97% average. Curriculum available upon request.

g. February 1985 to July 1985, RADCON SE-2 Scientific Aide, Tennessee Valley Authority, Browns Ferry Nuclear Plant

Worked with plant ALARA section in the development of computerized radiation work permit information and dose tracking. Implemented special projects for Administrative RADCON Manager.