



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
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DOCKET: 70-622  
 LICENSEE: Department of the Army  
 FACILITY: U.S. Army Armament Research, Development  
 and Engineering Center  
 Picatinny Arsenal  
 Dover, New Jersey  
 SUBJECT: SAFETY EVALUATION REPORT: APPLICATION DATED JULY 29, 1992,  
 RE RENEWAL

BACKGROUND

By letter dated July 29, 1992, the Department of the Army, U.S. Army Armament Research Development and Engineering Center (ARDEC) requested renewal of Special Nuclear Materials License SNM-561. The renewal application had been submitted in accordance with the timely renewal provisions of 10 CFR 70.33(b) and, therefore, the existing license remains in effect. An updated license renewal application was submitted by letter dated August 28, 1992: Modifications to the renewal application were submitted by letter dated December 14, 1993. By letter dated January 5, 1994, ARDEC requested an exemption from the criticality monitoring requirements of 10 CFR 70.24. This exemption request had been inadvertently omitted from the renewal application.

SCOPE OF REVIEW

The safety review of ARDEC's renewal request includes a review of the application dated July 29, 1992, updated application dated August 28, 1992, supplemental information dated December 14, 1993, and the licensee's compliance history. The topics of review for this safety evaluation report include the licensee's organization and radiation safety program.

DISCUSSION

Possession Limits

ARDEC is requesting possession of the following quantities of radioactive material:

Radioactive Material	Chemical and/or Physical Form	Maximum Amount of Material Authorized for Possession
A. Plutonium-239	A. Plate/Foil	A. 2 milligrams total
B. Plutonium-238	B. Thermal batteries	B. 4.8 grams

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C. Plutonium-238	C. Plate/Foil	C. 1 microgram
D. Neptunium-237	D. Plate/Foil	D. 15 milligrams
E. Uranium enriched to $\leq 93.27$ wt percent in the $^{235}\text{U}$ isotope	E. Sealed Material Test Reactor-type fuel elements	E. 1,716 grams of U-235

ARDEC had previously been authorized to possess and use an 80 gram plutonium beryllium (PuBe) sealed neutron source. This source was transferred to Kean College in New Jersey on April 13, 1979. Since ARDEC does not plan to obtain more PuBe sealed neutron sources, they have requested authorization be removed from their license.

The plutonium and neptunium in the form of plates or foil may be used as tools in the study of other materials or as check sources. The thermal batteries containing  $^{238}\text{U}$  are an experimental power source for a classified project.

The Material Test Reactor (MTR) fuel is for use with the Californium Flux Multiplication System (CFX). The CFX is a subcritical assembly where the MTR fuel surrounds a californium-252 neutron source. ARDEC is authorized only to store the MTR fuel. They are not authorized to operate the system. The fuel is stored in accordance with the approved "Physical Security Plan for SNM-561 CFX Uranium-235 Sources." Should ARDEC decide to use the CFX, an amendment request with sufficient documentation for the safe use of the system will be submitted to the Nuclear Regulatory Commission for review and approval.

All material licensed under SNM-561 will be used and stored at the U.S. Army Armament Research, Development and Engineering Center, Picatinny Arsenal, Dover, New Jersey.

#### Organization and Qualifications

The Commander of ARDEC is ultimately responsible for the installation and its activities, including the radiation protection program. However, the responsibilities of managing this license and running the ARDEC radiation protection program have been delegated to the Radiation Protection Officer (RPO). Day-to-day operations are carried out and managed by members of the health physics staff. Several members of the health physics staff have been designated as alternate RPO.

The present RPO and those designated as alternate RPO have sufficient formal training and experience in radiation protection to properly manage the radiation protection program. However, because there is no commitment in the renewal application specifying minimal training or experience for the RPO or alternate RPO positions and to ensure that future individuals holding these positions are qualified, the following conditions shall continue:

11. The minimum technical qualifications for the position of Radiation Protection Officer shall be a bachelor's degree in health physics, physical/life science, or engineering and two years experience in applied radiation safety.
12. The minimum qualifications for the position of Alternate Radiation Protection Officer shall be a bachelor's degree in health physics, physical/life sciences, or engineering, with one year of experience in radiation safety.

The Ionizing Radiation Control Committee (IRCC) was established to advise on command policies for the safe use, handling, storage, receipt, shipment, and disposal of sources of ionizing radiation and radiation-producing devices. The Chief, Safety, Surety, and Environmental Office holds the position of IRCC Chairman and acts as the Commander's representative. Specific responsibilities of the IRCC include reviewing and providing comments on new radiation programs, new radiation facilities, and new or revised standard operating procedures; reviewing any proposed revisions to NRC licenses or Department of Army Authorizations; reviewing, providing comments, and approving potential radiation workers; providing expert advice during incident/accident investigations; and reviewing accident/incident reports and recommending ARDEC policy changes, as appropriate. The IRCC meets at least quarterly.

Because the IRCC has the authority and responsibility for reviewing and approving all operations and programs involving radioactive materials, the following condition shall continue:

13. The minimum technical qualifications for three of the Ionizing Radiation Control Committee members shall be a bachelor's degree in health physics, physical/life science, or engineering and two years of experience in radiation and/or nuclear safety programs.

#### Radiation Safety Program

All radiation workers, except those working with tritium, are issued thermoluminescent dosimeters (TLDs). The TLDs are exchanged quarterly. As appropriate, TLD finger rings are also issued quarterly. TLDs are issued, processed, and analyzed by the U.S. Army Ionizing Radiation Dosimetry Center in Lexington, Kentucky and is NVLAP (National Voluntary Laboratory Accreditation Program) accredited.

ARDEC health physics personnel perform radiation surveys at least monthly in areas where radioactive materials authorized by this license are being used. If the facilities or operations that utilize these sources become inactive, radiation surveys will be then performed at least quarterly. Special surveys will be performed should an abnormal event or circumstance arise.

The radioactive material authorized by this license are in the form of sealed sources, clad fuel elements, and batteries. Since the materials are contained and nondispersible, contamination and internal exposure hazards are negligible. The licensee has committed to leak testing the alpha sources

every three months. The following conditions which specify criteria for leak testing of plutonium sealed sources and alpha sources shall apply:

14. Sealed plutonium sources shall be subject to the leak testing and actions specified in the attached, "License Condition for Leak Testing Sealed Plutonium Sources," April 1993.
15. Plutonium alpha sources shall be subject to the leak testing and actions specified in the attached, "License Condition for Plutonium Alpha Sources," April 1993.

#### Nuclear Material Safety and Control

ARDEC is authorized for the storage only of the MTR fuel elements. The fuel is stored in Building 3030, inside a locked steel cage which has a security alarm. The fuel elements are stored in the original shipping containers, 55-gallon DOT 6M drums. ARDEC has been exempted from the criticality monitoring requirements specified in 10 CFR 70.24 since the MTR fuel was obtained. Therefore, the following condition shall continue:

16. The licensee is hereby exempted from the provisions of 10 CFR 70.24 insofar as this section applies to materials held under the license.

The MTR fuel elements meet the description of special nuclear material of moderate strategic significance as defined in 10 CFR 70.4. Therefore, in accordance with the provisions of 10 CFR 70.22(e), ARDEC maintains a Physical Security Plan for the protection of the fuel. By letter dated August 28, 1992, ARDEC submitted, for NRC review and approval, revision to the plan. These revisions were approved by NRC Region I by letter dated August 11, 1993. The following condition shall apply to ensure that the current revision of the plan is used:

17. The licensee shall follow the physical protection plan entitled, "Physical Security Plan for SNM-561 CFX Uranium-235 Sources (Rev. 0)" dated July 29, 1988, as revised by Revision 1 dated August 7, 1992 (letter dated August 28, 1992), and as it may be further revised in accordance with the provisions of 10 CFR 70.32(e).

#### Environmental Protection

In accordance with 10 CFR 51.21, the staff has prepared an assessment of environmental impacts for continuing operations. The Environmental Assessment was prepared and issued on November 17, 1993. This assessment supports a Finding of No Significant Impact which was published in the Federal Register on November 24, 1993.

#### Emergency Planning

Because of the physical forms and storage conditions of the authorized material, the staff has determined that a Radiological Contingency Plan is not required. However, activities at ARDEC not involving radioactive materials require provisions for emergency preparedness. Fire department personnel who

would respond in the event of an emergency are trained in radiation hazards and procedures for handling radiation emergencies. If RPO staff is unavailable, the fire department controls the emergency situation until the RPO or other radiation safety personnel can respond.

#### Compliance History

A review of the inspection reports by Region I indicates that four inspections were made since August 1987. During this period only one item of noncompliance with the license was identified. As a result of the inspection conducted on July 8-10, 1992, the inspector determined that a password was not changed at the frequency required by the Physical Security Plan. The inspector reviewed the other physical security measure for the area and determined that unauthorized access to the storage area would be very difficult. This was classified as a Severity Level V violation. Subsequent inspections have indicated that this violation has not been repeated.

#### DECOMMISSIONING PLAN

The applicant has committed to decommissioning at the end of the facility life and the release of items for unrestricted use in accordance with the "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," April 1993. The staff recommends the following condition to ensure the guidelines are current:

18. Upon determination of operations or prior to the release of equipment for unrestricted use, the facility and equipment shall be decontaminated in accordance with the attached, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," April 1993.

#### CONCLUSION AND RECOMMENDATION

Based on the information supplied by the licensee, the impact to human health and safety and the environment from activities authorized by this license are minimal.

The Region I staff has no objection to the renewal of this license.

Principal Contributor:

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