

DOCKET: 70-157

LICENSEE: University of Texas-Austin

SUBJECT: SAFETY EVALUATION REPORT: LICENSE RENEWAL APPLICATION DATED  
DECEMBER 13, 2007, FOR THE UNIVERSITY OF TEXAS-AUSTIN SPECIAL  
NUCLEAR MATERIAL LICENSE NO. SNM-180

## I. INTRODUCTION

By letter dated December 13, 2007, the Nuclear Engineering Teaching Laboratory (NETL) of the University of Texas at Austin (UTX-A) submitted an application (ML080240243) to the U.S. Nuclear Regulatory Commission (NRC) requesting renewal of its Special Nuclear Material License (SNM) No. SNM-180. The request is made pursuant to the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR), Sections 70.33 and 70.38(a). The NETL proposes that its facility continue to possess and use SNM for training and educational purposes, as described in the license renewal application. The NETL supplemented its application with additional submittals dated January 29, 2009, (non-public version) and February 20, 2009 (redacted version; ML092030533). The NETL has requested a renewed license term of 10 years.

The NRC staff conducted its safety and safeguards review in accordance with 10 CFR Part 20, "Standards for Protection Against Radiation," 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," 10 CFR Part 73, "Physical Protection of Plants and Materials," 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material," and other applicable regulations.

The NRC staff used guidance in NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility" (NRC, 2002) (NUREG-1520) and other applicable guidance documents to conduct its safety review. The NRC staff's safeguards review included the review of the NETL's Physical Security Plan, and the NETL's transportation security. The NRC staff also reviewed their Emergency Plan. Where the NETL's safety programs should be supplemented, the NRC staff has identified license conditions to provide assurance of safe operation.

The NETL has a Training, Research, Isotopes, General Atomics (TRIGA) research reactor, which operates under NRC Reactor License No. R-129; and a charged particle accelerator, which operates under a Certificate of Registration from the State of Texas Department of Health, Bureau of Radiation Control. The State of Texas, an Agreement State, issued a license to the NETL for the activities associated with the particle accelerator (License No. TDH 100485). The activities associated with these two licenses are independent of the SNM license and are not discussed in this Safety Evaluation Report (SER).

A notice of opportunity to request a hearing on the license renewal application was published in the *Federal Register* (FR) on September 10, 2009 (74 FR 46626). No requests for a hearing were received.

## II. DISCUSSION

### a) General Information

The NETL uses SNM to supplement its training and instruction programs in the field of nuclear engineering. Specifically, the licensed materials are to be used in experiments at the facilities of the Nuclear Engineering Laboratory at the J.J. Pickle Research Campus of the UTX-A.

The NETL is requesting authorization to possess and use SNM for: (a) its U-235 subcritical reactor assembly; (b) plutonium-beryllium neutron sources; and (c) the Manhattan College Zero Power Reactor (MCZPR) fuel. The license renewal application described the characteristics and composition of the SNM to be used in these applications. It also included acceptable drawings illustrating the facility layout where the proposed activities would take place.

The NRC staff reviewed the license renewal application to determine whether the NETL was required to provide Integrated Safety Analysis (ISA) Summary information, pursuant to the provisions in 10 CFR Part 70 Subpart H, "Additional Requirements for Certain Licensees Authorized to Possess a Critical Mass of Special Nuclear Material." The NRC staff notes that as the proposed activities for which the license would be renewed do not meet the criteria in 10 CFR 70.60, 10 CFR Part 70, Subpart H is not applicable to the license renewal application. As a result, the NRC staff concludes that the NETL is not required to submit an ISA Summary in support of its license renewal application.

The NETL is requesting approval to use SNM for its educational programs, as described below:

MATERIAL	FORM	QUANTITY	AUTHORIZED USE(S)
Uranium Enriched to less than 20 % in the isotope U-235	Uranium Dioxide in High Density Polyethylene	<b>XXXX</b>	Instruction and Educational Programs at the NETL
Plutonium	Sealed Plutonium-Beryllium Neutron Sources	<b>XXXX</b>	Instruction and Educational Programs at the NETL
Uranium Enriched to less than 20 % in the isotope U-235	Uranium Silicide in Aluminum Matrix	<b>XXXX</b>	Instruction and Educational Programs at the NETL

The UTX-A is a public university with over 50 million dollars worth of assets and is financially supported by the State of Texas. Licensed activities will be conducted at the Nuclear Engineering Laboratory and include activities conducted under the three licenses described earlier in this SER.

The NRC staff reviewed the license renewal application and concludes that the NETL adequately described its facility and the proposed uses of the SNM for which the license is sought. Therefore, the NRC staff concludes that the information provided by the NETL meets the applicable requirements in 10 CFR 70.22 and 10 CFR 70.33 and is, therefore, acceptable.

b) Organization and Administration

The administrative structure of the NETL is part of a broader organization that oversees the radiation protection program at UTX-A. This organization consists of six components: (a) the Radiation Safety Committee (RSC); (b) the Radiation Safety Officer (RSO); (c) the Reactor Oversight Committee (ROC); (d) the NETL Director; (e) the NETL Associate or Assistant Director; and (f) the Laboratory Staff. The license renewal application described the qualifications (e.g., education requirements and professional experience) of the individuals in these positions such as education requirements and professional experience. The license renewal application also provided an acceptable organizational chart illustrating the reporting relationship of the different functional groups within the UTX-A.

The president of the UTX-A established an RSC whose purpose is defining policies and practices regarding the safe use of radioisotopes and radiation sources within the UTX-A campus. The RSO has the authority, as delegated by the RSC, for establishing and inspecting the university's radiation safety program. The RSC consists for three faculty and/or staff members from the science and engineering departments.

The ROC reports to the Dean of the College of Engineering and is responsible for reviewing, evaluating, approving, and auditing activities and procedures associated with the operation of the NETL. The ROC's jurisdiction includes all activities involving the university's nuclear reactor, use of SNM and radiological operations in the laboratory facility, and general safety standards. The ROC consists of at least three members knowledgeable in the field of nuclear safety. Members of the ROC include the RSO and the NETL Director.

The NETL Director oversees the daily activities at the laboratory and may or may not be an NRC licensed senior operator. The NETL Director directs and supervises the operation of the nuclear reactor and other laboratory activities. If absent, the NETL Director may delegate the authority to the NETL Associate or Assistant Directors.

The staff at the NETL consists of a reactor operator, a health physicist, and other laboratory personnel. These individuals perform activities that support the daily operations of the NETL. The reactor operator operates and maintains the reactor and associated equipment and also reviews procedures and regulations. The reactor operator also instructs and assists students and researchers, and supports record maintenance and report preparations. The health physicist directs monitoring and training programs for NETL personnel. The health physicist also administers and implements the NETL's safety program, provides technical assistance to all personnel using radiation and radioactive materials at the reactor facility, and has the authority to suspend activities due to safety concerns.

The NRC staff reviewed the license renewal application and concludes that the NETL has an acceptable organization, administrative policies, and sufficient competent resources that provide reasonable assurance of adequate safety for the proposed activities. Therefore, the NRC staff concludes that the information provided by the NETL meets the applicable requirements in 10 CFR 70.22 and 10 CFR 70.33 and is, therefore, acceptable.

c) Radiation Protection

Radiation Protection Roles and Responsibilities

In its license renewal application, the NETL provided a description of the radiation protection (RP) program used at the facility to meet the requirements of 10 CFR Parts 19, 20, and 70, including personnel monitoring and training practices, commitments for leak-testing sources, commitments for maintaining doses as low as is reasonably achievable (ALARA), and waste disposal practices. The license renewal application also discussed the roles and responsibilities of the different individuals implementing the RP program. The information provided by the NETL concerning the roles and responsibilities in the RP program is adequate to demonstrate compliance with the applicable regulatory requirements.

As Low As Reasonable Achievable Commitment

The licensee has committed to maintaining radiation doses ALARA and has established an ALARA Safety Committee (ALARA Committee). The ALARA Committee ensures ALARA principles are incorporated into written NETL procedures. For example, internal procedures require the routine handling of the plutonium-beryllium sources to be accomplished with long-handled tongs and long threaded rods to maximize distance between the source and the individual. Radiation doses to staff, students, and visitors are reviewed periodically by laboratory staff and monthly by the university's Office of Environmental Health and Safety. The ALARA Committee also conducts an annual review of the dose reports, experiments performed, and any significant deviations from expected exposures. The ALARA Committee's periodic review of doses and the RP program is consistent with the regulatory requirements in 10 CFR 20.1101(b) and demonstrates compliance with the applicable regulations.

Organization and Personal Qualifications

The administration of the RP program in support of activities at the NETL is the responsibility of the ROC. The organization within the NETL supporting the RP program includes individuals such as the NETL Director, Associate Directors, Reactor Operators, and the Health Physicist (HP). The HP has the primary responsibility for implementing the RP program on a daily basis. Additional staff members include technicians, students and research associates who support experiments conducted in the NETL. The senior members are required to have a Bachelor's degree in an engineering or scientific field and multiple years work experience, preferably in the nuclear field. The specific qualifications are defined in the license renewal application. The qualifications required by these sections demonstrate compliance with the requirements in 10 CFR 70.22(a)(6) and are sufficient for the licensed activities described in the license renewal application. In addition to the senior staff, trained technicians and faculty work with students under HP supervision to conduct experiments and work with radioactive material. These individuals work together to ensure a robust RP program that complies with internal procedures and regulatory requirements.

Written Procedures

The NETL maintains written procedures pertaining to the performance of activities involving radioactive materials in a safe manner. Laboratory staff and students are required to review procedures at the beginning of their employment and receive refresher training at least every two years. Minor changes to procedures may be implemented with the approval of the NETL

Director, but major procedure modifications must be reviewed and approved by the ROC before their implementation.

The NETL has established procedures for monitoring exposure, operating the facility, and for emergency response activities. Exposure procedures limit access to the NETL, require personal dosimetry, and require a periodic inventory of the radioactive material. Sources must be leak tested on a six-month cycle in accordance with internal procedures. Oversight by a reactor supervisor is required during operations, and radiation surveys are also required during radioactive material use.

Before their implementation, new experiments and operations, which are not covered by standard procedures, require Radiation Work Permits (RWPs) that are developed by the staff and pre-approved by the HP. These RWPs are reviewed on a monthly basis by the HP and annually by the ALARA Committee. The emergency procedures are located in the NETL emergency plan which is maintained for the NRC's reactor license R-129.

The NETL's program to operate the facility in accordance with approved written procedures and augmented by RWPs provides reasonable assurance of adequate safety to the workers, and meet the requirements in 10 CFR 70.22(a)(8).

#### Training Program

The subcritical assembly is used to teach basic concepts to undergraduate and graduate students during laboratory exercises. Prior to participation at the NETL, students and staff must pass a formal, written occupational radiation worker training. This training is specifically designed to meet the regulatory requirements of 10 CFR 19.12 and covers areas such as radiation hazards, maintaining doses ALARA, laboratory procedures, and personal contamination surveys. Radiation workers are required to complete refresher training every two years, and the training program undergoes a yearly audit which is performed by the ROC. The program to train staff, maintaining the training content, and employing qualified staff described in the license renewal application demonstrates reasonable assurance of compliance with 10 CFR 19.12 and 10 CFR 70.22(a)(6).

#### Radiation Surveys and Monitoring Programs

The potential for radioactive contamination from the subcritical assembly is limited by the low activity of the system and by the protective shielding which encases the radioactive material. Short lived activation products may be produced in foils during experimentation. These foils and the plutonium sources are handled in accordance with ALARA principles using lead and concrete shielding, long handled tools, and decay time, as appropriate, to minimize dose. Individuals likely to receive over 10 percent of the annual dose limits are required to wear dosimetry, in accordance with 10 CFR 20.1502. Pocket ionization chambers and neutron dosimeters may be issued at the discretion of the HP.

The NETL also maintains a system of portable and fixed radiation monitors with capability to detect alpha, beta, gamma, and neutron radiation. These monitors are calibrated at least annually and are used for dose assessment for the subcritical assembly and other Laboratory activities. Fixed dosimeters are also used to provide trending data for ALARA and to verify that doses to the public comply with the regulatory limits.

The subcritical assembly is stored and operated in the reactor room which has multiple area radiation monitors and a continuous air monitor, all of which have preset audible alarm indicators. Dose monitoring which indicates an exposure above the administrative limit of 1000 milliroentgen in a year will be investigated by the ALARA Committee. The limited activity and shielding of the subcritical assembly combined with the survey and monitoring programs described in the application demonstrate reasonable assurance of compliance with 10 CFR Part 20, Subpart F, "Surveys and Monitoring."

#### Contamination Control and Waste Handling

Since the subcritical assembly is completely encased, there is minimal risk of airborne or external contamination. Handling the subcritical assembly or activated foils may lead to minor contamination of tweezers and gloves due to activation products. As a result, these items are disposed of as low level radioactive waste. Personnel are required to survey their hands immediately after working with radioactive materials. All individuals who exit a controlled area are also required to perform a contamination survey using the building's portal monitor or a hand-held frisker. All contamination events, personnel radiation exposures and facility effluent releases are tracked and records are retained for the lifetime of the facility.

Signs and ropes are used to define radiation areas during the subcritical assemblies operation to prevent inadvertent exposure or contamination. In addition, the area of operations is in the same location as the research reactor which has additional entry controls that ensure access is limited to authorized individuals. The waste handling, contamination monitoring, and radiation precautions described in the license renewal application meet the regulatory requirements in 10 CFR Part 20, and are found acceptable.

#### Evaluation of Radiation Protection Findings

The NETL has committed to an acceptable RP program that includes: (1) a program to ensure that occupational radiological exposures are ALARA; (2) an organization with adequate qualification requirements for the radiation protection personnel; (3) approved written radiation protection procedures and RWPs for radiation protection activities; (4) radiation protection training for all personnel who have access to restricted areas; (5) a radiation survey and monitoring program that includes requirements for controlling radiological contamination within the facility and monitoring radiation exposures; and (6) other programs to maintain records.

The NETL's current license contains two license conditions. Safety condition 11 requires the training of personnel prior to any work with, or handling of, licensed material. Alternatively, non-trained personnel should work under the supervision of a person that was formally trained in the area of radiation safety. Safety condition 12 requires that the NETL evaluate data on radiation doses to the workers at least on an annual basis to confirm that the doses received remain ALARA. The NRC staff notes that Sections VII.D and VIII in the license renewal application describe the commitments covered by these license conditions. As a result, the NRC staff concludes that the following conditions should be deleted from the renewed license:

11. Prior to working with or handling licensed nuclear material, all personnel shall receive training or shall be under the supervision of persons who have received training in the formal radiation safety program.

12. The licensee shall review radiation dose data at least annually to ensure that doses are maintained ALARA and shall report the findings of the assessment to the Radiation Safety Committee.

The NRC staff concludes that the radiation protection program described in the license renewal application is adequate and meets the requirements in 10 CFR Parts 19, 20, and 70.

d) Nuclear Criticality Safety

The NRC staff reviewed the material and possession limits in the NETL's license to determine whether there was a nuclear criticality safety (NCS) concern. The NRC staff also reviewed the analysis of the NETL's NCS program documented in the SER for the previous license renewal to determine if the safety conclusions needed a re-evaluation based on the information in the current license renewal application.

Based on the type, form, and/or quantity of material, the NRC staff concluded that the materials in License Condition 6B (i.e., plutonium-beryllium neutron sources used for neutron detector calibration, subcritical reactor multiplication source, neutron shielding and neutron dose measurement experiments) are not an NCS concern because they do not exceed the thresholds for a critical mass of plutonium, as defined in 10 CFR 70.4.

The subcritical assembly and the reflector media material are used with neutron sources to demonstrate the concepts of subcritical multiplication, thermal diffusion, fermi age, flux measurement and other basic nuclear engineering principles. Experiments have been conducted with the subcritical reactor assembly and neutron sources, which show a multiplication factor (MF) of less than 8 for all reflector and fuel conditions, including proximity to the research reactor. Using the formula,  $k_{\text{effective}} = (1 - 1/\text{MF})$ , this corresponds to a  $k_{\text{effective}}$  of 0.87 which means that the fuel is insufficient to achieve accidental criticality. Therefore, the NRC staff concludes that the NETL is not required to have a criticality monitoring system for the materials in License Condition 6A and 6B.

The material in License Condition 6C is authorized for storage (i.e., possession-only status). The Manhattan College Zero Power Reactor (MCZPR) fuel elements were transferred to the University of Texas at Austin in August 2004, and authorized for storage on approved storage racks at the NETL by Amendment 2 to the license, dated April 22, 2005 (ML072630606, ML072630613, and ML072630617). The NRC's review concluded that the storage of the reactor fuel elements was found acceptable. The NRC staff reviewed this information in Appendix F of the license renewal application. The NRC staff concluded that the analysis performed in support of the issuance of Amendment 2 to the current license is still applicable for the license renewal application.

The MCZPR fuel elements are monitored by a criticality accident alarm system in accordance with the requirements in 10 CFR 70.24 and the guidance in the American National Standards Institute (ANSI)/American Nuclear Society (ANS)-8.3, "Criticality Accident Alarm System (CAAS)," 1997 (Reaffirmed in 2003), as modified by NRC Regulatory Guide 3.71. Criticality monitoring is performed by two independent Ludlum Model 375 Area Monitors with one system configured as a gamma radiation detector and one system configured as a neutron monitor. The detectors are located in the same room where the MCZPR fuel is stored. The facility area radiation monitoring (ARM) system provides a backup gamma radiation monitoring system with one detector located about 15 feet away from the room where the fuel is stored.

If the CAAS instrument fails or has been removed from service for annual calibration, a second dual Ludlum Model 375 Area Monitor is available for replacement. A channel check of the CAAS is performed once per week and the system is calibrated annually. Any movement of material into, or out of the room where the fuel is stored, is not allowed while the CAAS is out of service (OOS). If the CAAS is OOS, and the NETL personnel is occupying the room where the fuel is stored, they would use a portable alarming radiation detector to monitor the immediate vicinity of the room until they leave the room or until the CAAS is returned to service.

The NRC staff concludes that there is reasonable assurance that the NCS program at the NETL is adequate to assure the safety of the requested SNM handling and storage activities, and that the regulatory requirements in 10 CFR 70.22(a)(7), (a)(8), and 70.24 are met.

e) Fire Protection

The NETL complied with the applicable building code regulations at the time of construction (Uniform Building Code as amended by the City of Austin, Travis County, and the State of Texas). The portion of the NETL facility containing the nuclear research reactor and stored licensed materials is fabricated of non-combustible construction. A lightning arrestor system is installed on the NETL roof and is periodically inspected. Building renovations and operations are reviewed by the NETL Director, with oversight by the Reactor Oversight Committee to ensure adequate safety of the building. The installed fire protection systems at NETL include smoke detection, heat detection, standpipes, and a sprinkler system in the laboratory wing. Fire loading in most areas is minimal. The fire protection systems interface with the university police dispatch and local 911 emergency systems.

Portable fire extinguishers are deployed within the building in accordance with industry standards. An underground fire main supplied by the municipal water system provides fire protection water to the facility. Fire hydrants are located throughout the campus in accordance with industry standards.

The NETL facility has a Radiation Safety Officer and a Reactor Supervisor who are responsible for periodic safety reviews. The Austin Fire Department (AFD) performs periodic emergency drills with the NETL. The AFD responders periodically tour the NETL for familiarization training. Procedures are in place to allow the fire department efficient access to the process areas during fire emergencies. Worker egress is adequately designed and maintained.

Fire prevention, inspection, testing, and maintenance of fire protection systems, and the qualification, drills, and training of facility personnel are in accordance with applicable NFPA codes and standards.

The NRC staff review determined that the NETL has met the guidance provided in the National Fire Protection Association (NFPA) 801, "Standard for Fire Protection for Facilities Handling Radioactive Material," 2003. The NRC staff notes that if there was a complete release of the licensed material, it would not result in an intermediate consequence event at the NETL. Given the low risk to public health and safety of the materials covered by the SNM-180 License, and the guidance provided in Section 7.4.3.2 of NUREG-1520 (NRC, 2002), a formal fire hazards analysis was not required. In accordance with 10 CFR 70.60, the facility is not required to have an ISA in support of its license renewal application.

The NRC staff has reviewed the NETL's fire protection program and determined that the NETL maintains an adequate level of fire protection at the facility to protect public health and safety.



The NRC staff concludes that the NETL's equipment, facilities, and procedures provide a reasonable level of assurance that adequate fire protection will be provided consistent with the requirements in 10 CFR 70.22(a)(7) and (a)(8).

f) Emergency Preparedness

The NETL possesses a research reactor license, License No. R-129, Docket No. 50-602. On January 1992, the NRC completed the review of the "Emergency Response Plan for the UT TRIGA Mark II Reactor facility," and concluded that the emergency procedures, guidance documents and off-site support agreements were acceptable. This review was documented in NUREG-1135, Supplement 1, "Safety Evaluation Report Related to the Construction Permit and Operating License for the Research Reactor at the University of Texas."

Amendment No. 1 to License No. SNM-180 (ML072630227, ML072630228, and ML072630233) authorized the receipt, possession and storage of SNM in Department of Transportation shipping containers at the NETL. The additional SNM authorized by this Amendment required a criticality accident alarm system under 10 CFR 70.24(a) and an emergency plan under 10 CFR 70.22(i)(1).

Amendment No. 2 to SNM-180 authorized the movement of SNM from the original shipping containers to approved storage racks. The location of the storage racks is within the reactor operations boundary which is the emergency planning zone for the reactor. The renewal application for License No. SNM-180 incorporates, by reference, the NETL Emergency Plan approved by the NRC under License No. R-129. The NETL Emergency Plan follows the guidance of ANSI/ANS 15.16, "Emergency Planning for Research Reactors," 2008, and the requirements of 10 CFR 50 Appendix E. The NETL considers all significant radiological and security incidents to be reportable at the Notification of Unusual Event (NOUE) level as the fission product inventory of the reactor fuel has been analyzed in the Final Safety Analysis Report to produce minimal doses at the building exterior."

The NRC staff concluded in the SER for License Amendment Number 2 to SNM-180 (ML072630606, ML072630613, and ML072630617) that there was reasonable assurance that a criticality accident would not occur due to: (1) the storage racks being subcritical when water moderated and fully water reflected; (2) not having any means to flood the area of the storage racks; (3) not having any water sources in the room and controlling the amount of flammable materials minimizing the need to introduce firefighting water; and (4) not having any interaction between the storage racks and existing areas containing special nuclear material.

In the January 29, 2009, response to the staff's request for additional information (ML092030534), the NETL provided a modified version of the application for license renewal. In the modified version, the NETL stated, in part, that: "[a]n inadvertent criticality of licensed materials stored outside the reactor is not explicitly covered in the Emergency Plan at this time but a change to the Emergency Plan under 10 CFR 50.54(q) will include a criticality accident under events reported to the NRC...." In addition, the licensee further states, in part, that "...an additional requirement shall be added to the Emergency Plan (10 CFR 50.54(q)) that will require an annual criticality accident evacuation drill." The NRC staff notes that the current version of the NETL Emergency Response Procedures has emergency action levels for emergency classification of radiological exposure and effluent events. In addition, the NETL Emergency Plan requires an annual drill for training and to test emergency response capabilities of facility personnel. Therefore, the NRC staff concludes that this annual drill will provide reasonable assurance that personnel at the NETL will adequately respond and, if necessary, evacuate in

the event of a criticality accident. The addition of the annual criticality accident evacuation drill, pursuant to the guidance in ANSI/ANS 8.23-2007, will enhance the NETL's capabilities to respond to such event.

The NETL Emergency Plan for the TRIGA Mark II reactor currently has emergency action levels for reactor and non-reactor events, and subsequent corrective actions for those events. The events associated with the SNM are bounded by the events analyzed for the TRIGA Mark II reactor for emergency planning purposes.

The NRC staff has reviewed the NETL's emergency preparedness program for the TRIGA Mark II reactor facility, as applicable for the renewal of License No. SNM-180, and determined that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Therefore, the NRC staff concludes that the NETL's emergency preparedness program meets the applicable requirements in 10 CFR 70.22 (a)(8) and 70.22(i)(1)(ii).

g) Decommissioning

The NRC staff reviewed the license renewal application for any applicability of the requirements in 10 CFR 70.22 (a)(9) and 70.25. The NETL is requesting authorization to possess and use SNM in the form of sealed sources, which poses less risk to the health and safety of the workers and the environment than unsealed SNM. The NRC staff concludes that the requirements in 10 CFR 70.22 (a)(9) and 70.25 do not apply to the proposed activities, and that NETL is not required to provide decommissioning financial assurance in support of its license renewal application.

h) Environmental Protection

As required by the facility reactor license R-129 (Docket No 50-602), a program of environmental radiation monitoring has been established to ensure that radiation doses to members of the public are in compliance with the requirements in 10 CFR 20 and ALARA. This monitoring program utilizes fixed integrating dosimetry provided by a contracted National Voluntary Laboratory Accreditation Program vendor. The NRC staff notes that the sealed sources licensed under License No. SNM-180 will not generate additional effluents that would warrant modifications to the program developed for the reactor license. The NRC staff has determined that the effluent control and monitoring program established for R-129 is sufficient for the materials licensed by SNM-180 and would provide reasonable assurance that the radiological effluents will not pose an adverse impact to public health and safety, or the environment.

i) Physical Protection and Physical security

On November 2, 1990, the NRC completed the review of the "University of Texas Physical Security Plan for the TRIGA Mark II Reactor" in support of License No. R-129. The NRC review concluded that the measures identified in the physical security plan met the fixed site and in-transit requirements specified for facilities with material of low strategic significance, in accordance with the requirements in 10 CFR 73.67. The following license condition is contained in License No. R-129:

The licensee shall fully implement and maintain in effect all provisions of the physical security plan approved by the Commission and all amendments and changes made pursuant to the

authority of 10 CFR 50.90 and 10 CFR 50.54(p). The approved plan, which is exempt from public disclosure pursuant to the provisions of 10 CFR 2.390(d), is entitled "Physical Security Plan for the UT [University of Texas] TRIGA Mark II Reactor Facility, Revision 1, dated August 1990.

The NETL license amendment request dated May 3, 2004, contained a commitment in the Emergency and Security Procedures section that all SNM material would be protected and controlled in accordance with previously approved physical security plans. The material subject to this amendment will be co-located with material licensed under Facility Operating License No. R-129 and will be afforded the same level of protection as described in the approved physical security plan.

Materials license SNM-180 requires the NETL to maintain security measures in accordance with the provisions of 10 CFR 73.67(f). The NETL meets these requirements through implementation of the NRC-approved Physical Security Plan. The NRC staff has reviewed and inspected the NETL's plan and procedures and their implementation and will continue to verify that the requirements are met.

Therefore, the NRC staff concludes that the NETL activities are covered by the NRC-approved Physical Security Plan which meets the applicable requirements in 10 CFR 73.67(f) and is, therefore, acceptable.

j) Material Control and Accounting

The NRC staff reviewed the license renewal application for any applicability of the requirements in 10 CFR 70.22(b). Since the licensed material for the NETL will be encapsulated, the NRC staff concludes that the requirements in 10 CFR 70.22(b) do not apply for the proposed operations. As a result, the NETL at UTX-A is not required to submit a Fundamental Nuclear Material Control Plan in support of its license renewal application.

In the license renewal application, the NETL commits to maintaining an SNM inventory and reporting program consistent with the requirements in 10 CFR 74.13. The NETL also commits to conducting physical inventories of their SNM and maintaining the required records in accordance with the requirements in 10 CFR 74.19. Finally, the NETL staff will report their nuclear material transactions consistent with the requirements in 10 CFR 74.15.

The NRC staff has reviewed the information and commitments in the license renewal application and concludes that the NETL will have adequate measures to report and account for any SNM owned, acquired, received, and transferred in support of the proposed activities at the licensed facility. Therefore, the NRC staff concludes that the information and commitments in the license renewal application meet the applicable requirements in 10 CFR Part 74.

### III. ENVIRONMENTAL ASSESSMENT

The NRC staff has determined that the proposed activities do not individually or cumulatively have a significant effect on the human environment because the activities involve the use of encapsulated radioactive materials for educational purposes. The NETL's use of encapsulated radioactive material poses a lower risk to the safety of the workers or the public, and the environment, than any uses involving unsealed radioactive materials. The NETL's licensed activities are categorically excluded from the requirement to prepare a site-specific

environmental assessment. Therefore, in accordance with 10 CFR 51.22(c)(14)(v), neither an environmental assessment nor an environmental impact statement is warranted for this action.

#### IV. CONCLUSION

The NRC staff concludes that the information and commitments provided by the NETL in their license renewal application provide reasonable assurance of adequate safety of the proposed operations. The NRC staff concludes that the proposed operations at the NETL of the UTX-A will not have an adverse impact on the public health and safety, the common defense and security, or the environment, and meet the applicable requirements in 10 CFR Parts 19, 20, 51, 70, 73, and 74.

#### V. PRINCIPAL CONTRIBUTORS

Mary Adams  
Matthew Bartlett  
James R. Downs  
Michael Norris  
Tamara Powell  
Rafael L. Rodriguez  
William C. Schuster

#### VI. REFERENCES

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(ANSI/ANS, 1997) ANSI/ANS 8.3, "Criticality Accident Alarm System (CAAS)," 1997 (Reaffirmed in 2003).

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(NRC, 2004) U.S. Nuclear Regulatory Commission, "Safety Evaluation Report – Submittal Dated May 3, 2004, Amendment Request to Receive and Possess **XXXX** of Special Nuclear Material (TAC L31830)," July 30, 2004.

(NRC, 2005) U.S. Nuclear Regulatory Commission, "Safety Evaluation Report – Submittal Dated May 3, 2004, Second Amendment Request to Move **XXXX** of Special Nuclear Material from Original Shipping Containers to Approved Storage Racks (TAC No. L31843)," April 22, 2005.

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