

SAFETY EVALUATION REPORT

DOCKET NO: 70-398

LICENSE NO: SNM-362

LICENSEE: U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

SUBJECT: AMENDMENT 10 - CHANGE TO POSSESSION LIMIT FOR
AMERICIUM-241 (ENTERPRISE PROJECT IDENTIFICATION
NUMBER L-2019-PMP-0024)

BACKGROUND

Special Nuclear Material (SNM) License SNM-362 was first issued in 1960 by the Atomic Energy Commission to the National Bureau of Standards (renamed as the National Institute of Standards and Technology [NIST] in 1988). The NIST is a Federal agency within the Department of Commerce, using licensed materials for research, development, calibration, and testing activities. Under SNM-362, NIST develops, maintains, and disseminates national standards for ionizing radiation and radioactivity to support health care, industry, and homeland security at its Gaithersburg, Maryland site.

By letter dated January 6, 2020 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML20023A339), NIST requested an increase in the possession limits for depleted uranium (DU) and americium in the isotope 241 (²⁴¹Am).

REGULATORY REQUIREMENTS

Title 10 of the *Code of Federal Regulations* (10 CFR) Paragraph 70.22(a)(4) states that the application shall contain the name, amount, and specifications (including the chemical and physical form) of the SNM the applicant proposes to possess.

Paragraph 70.22(a)(6) of 10 CFR states each application for a license shall contain the technical qualifications, including training and experience of the applicant and members of his staff to engage in the proposed activities in accordance with the regulations in this chapter.

DISCUSSION

On January 2, 2020, a scheduled radioactive material inventory was conducted. During the inventory, 55.72 kilograms (kg) of DU was found within a drum in the form of 10 plates of approximately 3.74 kg each, and 1 brick of approximately 18.3 kg. This material was not accounted for on the standing license. The NIST notified the licensing project manager at Headquarters and Region 1 inspection staff of the finding by telephone the day of the discovery.

At the time of discovery of the material, the NIST inventory was 46.9 kg of DU or 85.3 percent of the possession limit (55 kg). The sum of the inventory and discovered additional DU was 102.6 kg. The discovery met the reporting requirements of 10 CFR 20.2203(a)(3)(i), levels of radiation or concentrations of radioactive material in a restricted area in excess of any applicable limit in the license. The NIST formally reported the finding in a 30-day report on

January 30, 2020 (ADAMS Accession No. ML20049A038). In consultation with Region I, NIST prepared a license amendment request (LAR) to adjust the possession limits of the license to accommodate the additional 55 kg DU.

During the preparation of the LAR, the NIST considered potential additional licensing needs to submit for consideration, and added an increase in possession limits of ^{241}Am . The LAR was submitted on January 6, 2020 (ADAMS Accession No. ML20023A339), and requested an increase in possession limits of DU from 55 kg to 110 kg and ^{241}Am from 50 to 100 milliCuries (mCi). The request for the additional DU was expected due to the material discovery, but no basis was provided for the additional ^{241}Am . A request for additional information (RAI) was sent on March 5, 2020 (ADAMS Accession No. ML20065J803). A response to the RAI was due on April 4, 2020. The Ionizing Radiation Safety Committee (IRSC) for the SNM-362 license is responsible for approving any changes to material uses pertaining to SNM-362, and due to the pandemic health emergency for COVID-19, were postponed from meeting in time to review and approve a response to the RAI. The NIST submitted a request on March 27, 2020 (ADAMS Accession No. ML20090A001) for a 60-day extension to respond to the RAI, which was approved on March 30, 2020 (ADAMS Accession No. ML20090D783).

The response to the RAI was received on June 3, 2020 (ADAMS Accession No. ML20167A000). The request for the additional DU was at the suggestion of Region I staff in order to facilitate compliance as rapidly as possible. The NIST had initially said they had no material need of the additional DU, and in parallel with submission of the amendment, initiated action to dispose of the material. The NIST disposed of this material on January 16, 2020, and reported this in the 30-day report submitted on January 30, 2020 (ADAMS Accession No. ML20049A038). In the response to the RAI, NIST withdrew the request for the additional DU to the license.

Regarding the requested increase of ^{241}Am , NIST explained in the RAI response that the increase was requested to accommodate a general increase in ^{241}Am from the decay of plutonium in the isotope 241 (^{241}Pu). The NIST is authorized to possess 4 Curies of ^{241}Pu and has been in possession of the material for many years. This material has a half-life of 14.4 years and naturally decays to ^{241}Am . The requested increase in Americium is to accommodate the natural ingrowth of ^{241}Am from the decay of ^{241}Pu .

FINDINGS

The request for an increase of DU in the amount of 55 kgs has been withdrawn due to the disposal of the material discovered. The possession limit will remain at 55 kg. The basis to the requested increase of ^{241}Am provided in the response to the RAI stated NIST no longer conducts research involving ^{241}Pu and is seeking other options. The NIST will seek another licensee who might use the material, or if no licensee is found, NIST will investigate disposal options. Any material changes affecting the SNM-362 license would be reported to the U.S. Nuclear Regulatory Commission to ensure compliance with commitments therein. In the meantime, the possession limit for ^{241}Am has been adjusted to 100 mCi.

The radiation safety officer has evaluated the proposed changes and determined that the existing controls under safety evaluations of proposed uses approved by the IRSC are adequate to ensure the safe and compliant use of the materials requested.

ENVIRONMENTAL REVIEW

According to 10 CFR 51.22(c)(14), an environmental review is not required for amendments of material licenses issued pursuant 10 CFR Parts 30, 31, 32, 33, 34, 35, 36, 39, 40 or part 70 authorizing the following types of activities:

- (i) Distribution of radioactive material and devices or products containing radioactive material to general licensees and to persons exempt from license.
- (ii) Use of radioactive materials for research and development and for educational purposes.
- (iii) Irradiators
- (iv) Use of sealed sources and use of gauging devices, analytical instruments and other devices containing sealed sources.
- (v) Use of uranium as shielding material in containers or devices.
- (vi) Possession of radioactive material incident to performing services such as installation, maintenance, leak tests, and calibration.

Materials License SNM-362 authorizes these types of activities. Therefore, in accordance with 10 CFR 51.22(c)(14), neither an environment assessment nor an environmental impact statement is warranted for this action. The changes in this amendment do not affect the scope or nature of the licensed activity and will not result in a significant change in the types or amounts of effluents released offsite. There will not be any significant increase in individual or cumulative occupational radiation exposure, and there will not be any significant increase in the potential or consequences from radiological accidents. There is no construction associated with these changes, so there will not be any impact from construction.

CONCLUSION

The NRC staff reviewed the licensee's amendment request as submitted on January 6, 2020 and the RAI response provided on June 3, 2020. The NRC staff concludes that the information and regulatory commitments provided by NIST in their license application provide reasonable assurance of adequate safety of the proposed operations, and 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, 36, 51, 70, 73, and 74.

RECOMMENDATION

The NRC staff recommends that the amendment request be approved.

PRINCIPAL CONTRIBUTOR

Tyrone D. Naquin, NMSS/DFM