

**October 16, 2022 – March 10, 2023 RAM NMED Events**

**6 total events**

**1 – Found Source**

1. On December 14, 2022, a consultant health physicist informed the department that a Troxler nuclear density gauge containing 3 millicuries of radium-226 beryllium (Ra:Be) had been found. The gauge was found in a trash transfer trailer entering Waste Management, Mountain View Reclamation Landfill on December 2, 2202. This load originated from West Virginia. The load was isolated until consultant health physicist was able to respond on December 13, 2022, to resurvey the trailer. A gamma radiation measurement made at contact with the source housing was 18 mR/hr at 1 foot from the approximate location of the source, the gamma dose rate was 5 mrem/hour. The device was placed in a locked storage shed posted with a Caution – Radioactive Material sign. The department was onsite during the recovery of the gauge and continues to investigate its origin.

**1 – Lost / Missing Source**

1. While reviewing seeds in waste at the licensee facility, Radiation Safety staff discovered 2 seeds missing. Documentation indicated seeds were retrieved from Pathology and taken to the Breast Center on 1/31/23. Pathology technicians were interviewed but offered conflicting information about disposal. It was confirmed the seeds were not in the patient. Radiation Safety staff surveyed all possible storage, transfer and waste locations in the Breast Center and Pathology. They also surveyed all waste needle boxes, biohazardous waste bins and cold waste cans including all lead storage containers used to store and transport seeds. The licensee assumes the seeds were disposed in non-radioactive waste stream: either biohazardous waste or normal trash. The seeds were not found.

**1 – Unplanned Contamination Event**

1. On February 16, 2023 the licensee received an exclusive use shipment of boxes of equipment from a client. Upon surveying the conveyance after unloading, the licensee found a small area of contamination ~2" x 2" in surface area on the bed of the trailer outside of where the boxes were positioned. The licensee isolated the trailer at its facility, decontaminated the area of contamination, resurveyed the trailer, and released it. The licensee informed their client of the issue.

**1 - Medical Event**

1. On January 11, 2023 an Authorized User (AU) in Interventional Radiology was attempting to treat a patient with 45.4 mCi of Yttrium-90 Therapshere. The AU could not get the spheres to infuse. After consultation with the manufacturer (Boston Scientific), they decided on aborting the procedure. It was determined the patient received zero activity and all the radioactivity from the spheres remained inside the treatment vial. The patient and referring physician have been informed.

## 2 – Leaking Sources

1. A source was wiped for routine leak testing on January 10, 2023, and results were obtained on January 12, 2023. The initial leak test indicated contamination below the 185 Bq threshold, on the order of 100 Bq. However, it displayed a distinct Cs-137 peak. This abnormal result triggered additional scrutiny. A second leak test confirmed measurable Cs-137 activity. Visual examination found a crack in the side of the vial, and a repeat leak test focused on this area found 232.2 nCi (8591 Bq) of removable contamination. The source was placed back in its storage pig, which was sealed in a plastic bag, marked, and placed in the radioactive waste storage. This source was not used outside of the hot lab. Extensive wipe testing was conducted in the hot lab to search for contamination, with a focus on areas that would have direct contact with this source, or would be a high cross-contamination risk, such as dose calibrator controls, computer keyboard and mouse, etc. No measurable contamination was found. The radiation safety officer contacted Eckert and Ziegler, and they were able to dispose of the leaking source.

2. On February 15, 2023, during a routine quarterly audit of the nuclear medicine department, a licensee found a Cs137 vial source used for dose calibrator quality control demonstrated removable contamination following a sealed source wipe test (3301 cpm). A wipe test was performed on the lead vial source shield demonstrating additional removable contamination (2764 cpm). Additional wipe testing of the vial source, lead shield, and vial source storage area did not demonstrate additional removable activity. Upon visual inspection, no discernable damage or cracks were evident on the vial source. Isotope specific efficiency was calculated for Cs137 using a rod source (ser# 510-22) and the removable contamination for the vial source was 0.00397  $\mu$ Ci and 0.0033  $\mu$ Ci from the vial shield. The vial source and lead container were removed from service, double bagged and placed in shielded decay vault for future disposal through a licensed broker. Although impossible to determine with certainty it is presumed that small cracks formed from either a drop or repeated manipulation with forceps and allowed for some isotope epoxy flakes to migrate to the outside of the vial container and picked up with the 'wet' wipe. This QC source was not for patient use or used around patients. There is no evidence that staff was contaminated.