March 2023 through September 2023

PA230014, NMED 230180

A licensee reported the inability to retract a 3.91 TBq (105.8 Ci) Ir-192 source (serial #72481M) into the radiography exposure device (QSA Global model 880 Delta, serial #D7890) during operations on 4/25/2023. While radiographing a 3-inch pipe positioned on a cart, the pipe fell off the cart onto the source guide tube. The guide tube was damaged, and the source was left in the exposed position, unable to be retracted or extended into the collimator. Lead blankets were placed on the damaged area of the guide tube. Radiation exposure rates at established boundaries were confirmed to be 0 mR/hour. MISTRAS staff calculated radiation exposures received to four employees involved in source retrieval at 0.98, 3.1, 5.7, and 7.5 mSv (98, 310, 570, and 750 mrem). Dosimetry badges were sent to Landauer for emergency processing. Results revealed 296, 472, 551, and 1,632 mR. The source was secured safely in the exposure device, locked in their vault, and tagged out of service. The exposure device was sent to the manufacturer to be inspected. The device was repaired by the manufacturer and returned to service. Corrective actions included providing ratcheting straps and bungie cords to radiography crews to secure materials being inspected, a safety stand-down was held with all radiographers to discuss securing materials to prevent damage to radiographic equipment, providing additional training to the involved radiographers on operating and emergency procedures, and sending out a radiation safety memo to all RSO's and radiographers.

PA230015, NMED 230219

A licensee reported a medical event involving a patient underdose. A patient was treated with a permanent Cs-131 seed implant on 3/28/2023 with a prescribed dose of 6,000 cGy (rad). The patient presented with a serious medical condition on 4/11/2023, which necessitated the immediate removal of the implant. The seeds were all accounted for and placed into storage for decay to background. The actual dose delivered was calculated to be 3,700 cGy (rad). The referring physician and patient were informed of the incident. The Pennsylvania Department of Environmental Protection performed a reactive inspection. The medical cause that necessitated the removal of the implanted source was not considered patient intervention.

PA230016, NMED 230226

A licensee reported that a vehicle containing a moisture/density gauge (Troxler model 3440, serial #33833) was stolen on 5/23/2023. The gauge contained a 1.63 GBq (44 mCi) Am-Be source and a 0.333 GBq (9 mCi) Cs-137 source. Local, regional, and State Police were contacted concerning the incident and a bulletin was issued. The Pennsylvania Department of Environmental Protection will perform a reactive inspection. The vehicle was recovered with the gauge still secure and intact in the trunk of the vehicle on 5/24/2023.

PA230017, NMED 230242

A licensee reported a stolen moisture/density gauge (Troxler model 3430, serial #29846) that contained a 1.63 GBq (44 mCi) Am-Be source and a 0.333 GBq (9 mCi) Cs-137 source. An employee reported to

police that their vehicle, containing the gauge, was stolen early in the day of 6/1/2023. The vehicle was located and returned to the employee within a few hours. The gauge was still properly stored in the truck and untouched, with no evidence that the trunk lock, gauge chain, chain lock, or gauge case had been tampered with.

PA230019, NMED230305

A licensee reported a medical event involving the underdose of Y-90 microspheres (MDS Nordion model TheraSphere) to a patient on 7/21/2023. The patient was prescribed an activity of 1.09 GBq (29.46 mCi) for a dose of 12,000 cGy (rad), but only received a dose of 9,140 cGy (rad). It was determined that 76.2% of the microspheres were delivered to the target tissue. The incident is believed to have been caused by microspheres attaching to the bottom and interior portion of the septum and remaining there through four flushes of the system. There was also clumping of the microspheres in the microcatheter, which did not clog the lines and remained in the microcatheter connector. There was no contamination in the room, or interior/exterior of the box. The required alarming personal dosimeter (Rados) on the back of the box read zero as expected after three flushes. The authorized user had no indication from pushing the line that anything was wrong with the flow and four flushes went into the patient with no problem. All procedures and policies were followed, and the administration was observed by the RSO and the Boston Scientific Corporation representative in the room. It was observed on the additional personal dosimeter on the steel arm coming from the box that the exposure rate did not decrease as expected after the original three flushes. The patient and referring physician were informed of the event.

PA230021, NMED 230322

A licensee reported a medical underdose involving a Y-90 microsphere (MDS Nordion model TheraSphere) administration on 8/3/2023. The administration occurred with no apparent difficulties. No leaks or spills were identified, as corroborated by post administration monitoring, which identified no contamination. However, when the waste was measured, it was determined that only 72.6% of the prescribed activity was administered to the patient. The patient was prescribed to receive an activity of 1.08 GBq (29.18 mCi), but only received an estimated 0.784 GBq (21.18 mCi). The patient and prescribing physician were informed of the incident. No adverse effects to the patient were anticipated.

PA230022, NMED 230349

A licensee reported that medical equipment failed to function as designed during patient treatment on 8/21/2023. A patient was scheduled for an intravascular brachytherapy treatment using a Beta-Cath device (Best Vascular model A1000, serial #91273) and a Sr-90 source train (serial #ZB948) that contained 24 sources with a total activity of 1.92 GBq (51.9 mCi). After the patient received their prescribed treatment and upon source retraction, the source train failed to return to the transfer device due to a kink in the catheter. An emergency bailout procedure was performed with the cardiologist removing the delivery catheter and guidewire from the patient. The delivery catheter was left attached to the transfer device and was placed into the temporary Plexiglas bailout box. The patient was surveyed to confirm that the sources had been removed. The bailout box was visually inspected and surveyed to confirm that the sources were in the catheter in the box. The box was then transferred to the Radiation Oncology secure storage area. The device will be returned to the manufacturer for

inspection. The authorized user stated that the patient treatment was complete, and the source train did not enter the device within three seconds, so they started emergency removal of the catheter from the patient and placed it in the bailout box. Total time from the end of treatment to the device/catheter placement in the bailout box was approximately 10 seconds. The kink in the catheter was noted to be approximately 15 cm from where it entered the patient, so no radiation overexposure or unintended dose was received by the patient. The patient received their prescribed dose of 1,840 cGy (rad). No medical personnel received a radiation overexposure.

PA230023, NMED 230354

A licensee reported a medical event involving prostate seed therapy that occurred on 8/23/2023. The patient was prescribed to receive 98 Cs-131 brachytherapy seeds with a total activity of 10.46 GBq (282.6 mCi). A total of 107 seeds were received based on the pre-plan volume. However, after the operation was completed, 37 seeds were unused. A total of 70 seeds were implanted for a total activity of 7.47 GBq (201.9 mCi). The physician and patient were informed of the incident.