April 1, 2021 – January 15, 2022 RAM NMED Events	
14 total events	
2 – Damaged Portable Nuclear Gauge.	
1.	The Department received notification from a licensee on October 6, 2021 that on September 21, 2021 a Model Humboldt 5001-EZ nuclear gauge (serial number 5434) was run over by a dump truck while on a temporary job site. The gauge contained 11 millicuries of Cesium 137 and 44 millicuries of Americium-241: Beryllium. The area was secured, and the licensee Radiation Safety Officer (RSO) determined that the sources were secure, and gauge was not leaking. The gauge was transported to the licensee's King of Prussia office and the sources were leak tested. The leak test samples showed no evidence of radiological material. The unit is out of service and will be sent to the manufacturer or other licensed facility for further review. There was no exposure to workers or the public.
2.	On December 16, 2021, a licensee informed the department that a nuclear density gauge had been damaged at a job site. While a Technician was carrying the Troxler gauge, they tripped and fell on top of the gauge handle. This broke off the handle about half-way from the top to the gauge. The portable gauge was a Troxler, 3400 series, Serial Number 15717, containing 8 millicuries of Cesium 137 and 40 millicuries Americium 241: Beryllium. The area was secured, and the RSO called a service provider for assistance. It was determined that the source was secured in the shielded position, and the gauge was not leaking. The service provider did site surveys and determined there was no dose to any employees or anyone on the job site. The handle was secured to the gauge, and it was transported back to the licensee's Pittsburgh office. Once at the office the gauge was placed in their office vault and was taken out of service. It will be held there until it can be sent to the manufacturer for disposal. There was no exposure to workers or the public.
2 - Inability to Retract Radiography Source	
1.	A licensee reported that on July 21, 2021 while using a QSA Global Model 880 containing a 135.5 curie source of iridium-192, the source failed to fully retract and lock. The source serial number is 32578M and the camera serial number is D9477. The technicians secured the area by adjusting their 2 mR/hr boundaries to an unshielded source distance and immediately contacted their company RSO. The licensee then contacted QSA Global who arrived onsite July 22, 2021 to retrieve the source. QSA took the camera and entire crank and assembly mechanism with them for evaluation. The licensee remained onsite to secure the boundary while QSA was there. No overexposures occurred, and all proper procedures were followed. The cause of the malfunction remains unknown.
2.	A licensee reported the inability to retract a 91 Ci Ir-192 source into a QSA Global model 880 Delta exposure device. The source had been exposed to check a weld on 10/6/2021. When the radiographer tried to retract the source, the locking mechanism slide would not lock. The radiographer approached the exposure device with a radiation survey meter and noticed that the readings were high, so he retreated. The area was roped off and placed under surveillance by the radiographer and assistant radiographer. The radiographer also noticed that his direct reading dosimeter was off scale, so he remained outside the boundary. The licensee dispatched an RSO with source retrieval authorization to recover the source. The source was secured later that same morning. The RSO received 60 millirem and his assistant received 20 millirem. The radiographer's dosimeter was sent for emergency processing and he was restricted from radiography work pending receipt of his results. The RSO's ring dosimeter was sent with the radiographer's badge for emergency processing. Emergency processing of the radiographer's and assistant radiographer's TLDs showed that the radiographer received approximately 9.3 rem and the assistant received approximately 2 rem. The licensee continued to monitor the radiographer's hands for erythema, as it was determined that the radiographer handled the guide tube and collimator with the source in an unshielded position. Both workers were placed on mandatory leave and the licensee committed to mandatory retraining of employees. The licensee went through dose reconstruction and event re-enactments to

	determine how the source disconnect occurred; a bent pin on the control cable seemed to be the cause of the event.
4 – Lost /Abandoned / Stolen	
1.	A licensee reported that on September 24, 2021, they had discovered two Germanium-68 sealed sources (0.7 millicuries each) had gone missing. The sources where part of a mobile coach that was being transported from a facility in Maryland to one in Illinois. The coach had stopped at a gated facility in Pennsylvania for a few nights. It is unclear, at this time, the location the coach stopped at within the state. It is also unclear as to whether the sources are truly lost, and if so, which state the sources may have been lost in. The consultant was still gathering all the facts regarding the full details of the misplaced sources and the NRC has become involved due to the multi-state nature of the event. The cause of the lost sources remains unknown.
2.	The Department received notification from a licensee on October 13, 2021 that a Troxler 3430 portable gauge (serial number 18794) was lost. The gauge contained 9 millicuries of Cesiums-137 and 44 millicuries of Americium-241: Beryllium. The authorized user began to secure the gauge in a case on the back of his truck by ensuring that the source rod was locked. However, he departed the site without properly securing the storage case to his truck. When the authorized user approached the center of town, a person alerted him that the tailgate on the truck was down. The authorized user realized that the gauge was missing and traveled back to the work site. He did not detect the gauge along the return to the work site and inquired if anyone had seen the gauge at the work site. He noted that there was traffic from employees leaving a nearby factory at the end of their shift. The employee contacted the licensee Radiation Safety Officer and informed him of the incident. The local State Police Barracks was also alerted. The licensee deployed an additional employee to search for the missing gauge. The search was hampered by poor visibility in the darkness. The gauge was recovered on October 15, 2021 at a private residence unrelated to the licensee. An individual found it alongside a highway, not an area traveled by the individual who had lost the gauge, and took it home. The gauge was left unattended on the front porch where it was collected by the licensee accompanied by the State Police. The electronics were damaged, but leak testing revealed no radiological leakage. The gauge will be sent to a service provider for further evaluation before possibly returning to service.
3.	On November 29, 2021 the Department was notified that a Pennsylvania Licensee permanently closed on February 26, 2021. It was licensed to possess an Alnor Model 7000 or 7200-series dew-pointer containing Radium-226 in metallic foil form with a maximum possession limit of 14 microcuries. The only contact person remaining is the former office manager. Emails from her on December 1, 2021 indicated the physical business assets were auctioned off and items that did not sell were picked up by a trash hauling company. The dates of the auction were between March 19 and March 25, 2021. The officer manager believes the dew-pointer was not sold at auction and was instead disposed of by a local trash hauler. However, the Department's Bureau of Investigations was able to track the gauge to New York and notified them to investigate.
4.	On December 28, 2021 a licensee reported to the department a lost Iodine-125 seed. On December 17, 2021 a patient had a radioactive seed implanted in her breast. The seed was implanted superficially according to the surgeon and contained approximately 100 - 150 microcuries of Iodine-125. The seed was calibrated at 0.212 millicuries on December 7, 2021. When the patient returned to have the seed explanted on December 28, 2021, it was discovered that the seed was not there. Licensee personnel went to the patient place of residence and surveyed the entire area, clothes and laundry facility and found readings the same as background. The seed was unable to be located. The licensee is developing a plan for corrective actions. No overexposures are expected as a result.

2 - Stuck / Broken Shutter	
1.	The Department was notified of an incident involving a broken / stuck shutter on October 20, 2021. The licensee, on March 26, 2019, identified a defective linear actuator assembly on one of its Beta Control Mk 1.0 (serial number 559 / KP983). The device contains 267 millicuries of Krypton-85. The defect prevented the source from returning fully to its home shielded position. After initial discovery, a service provider manually moved the device to fully align with the shutter assembly. Later, it was discovered the unit had again drifted out of alignment. At this time, a service provider installed a plate directly on the device effectively sealing the unit, regardless of alignment with shutter assembly. No overexposures resulted from this event.
2.	On October 20, 2021, the licensee informed the Department of a failure of a shutter that happened on October 5, 2020. The licensee identified a failed return spring on one of its NDC 103 (serial number 3020641) devices. The device contains 148 millicuries of Americium-241. The written report received from the service provider stated that the secondary shutter device for the device in question failed to close. However, the primary shutter assembly remained operational at all times. The secondary shutter assembly defect was addressed at the earliest possible time (next scheduled machine downtime event). No overexposures resulted from this event.
4 - Medical Events	
1.	The Department received notification from a licensee on July 2, 2021 of a medical event involving Yttrium-90 TheraSphere. The licensee noted 71% of the prescribed dose of 30.8 millicuries was administered to the patient. A mechanical blockage occurred in the delivery system preventing the spheres from exiting the administration vial. All material was contained in the delivery system, lines, and patient. Area monitoring confirmed that no leak occurred and there was no contamination of the work area. Nuclear Medicine imaging of the waste confirmed activity concentrated within the vial. The physician and patient have been notified. No adverse effects to the patient are anticipated.
2.	On July 22, 2021 a patient was receiving a Lutetium-177 (Lutathera®) treatment when technicians had difficulty establishing an IV injection site and flow. Several attempts were made but ultimately, they all failed. The prescribed dose was 200 millicuries but it is estimated that the patient received only 18 millicuries. No adverse effects to the patient are noted at this time and none are expected. The patient and prescribing physician have been informed. Preliminary cause is suspected to be poor venous access for patient as well as incorrect gauge needle used for patient access.
3.	On December 6, 2021 a patient underwent a Yttrium- 90 TheraSphere treatment. There were no apparent issues during the treatment, but the four-sided equipment readings before and after treatment indicated that only 63% of the prescribed dosage was received by the patient. The prescribed dose was 4.08 GigaBecquerels and the calculated received dose was 2.57 GigaBecquerels. Preliminarily the licensee believes there was a flow issue and the micro catheter caused some of the material to precipitate out. The licensee is currently investigating to determine if that is the cause. The patient and physician have been informed. No adverse effects to the patient are anticipated.

Medical Events (Continued):	
4.	On December 10, 2021 the RSO for the licensee verbally reported a patient being treated for vaginal cancer was prescribed a 21 Gray total dose, delivered in 3 fractions of 7 Gray each via HDR. The first fraction was delivered on October 28, 2021. At some point after this fraction the patient began experiencing complications from her hysterectomy and sought treatment at Magee Women's Hospital. The patient did not return to the licensee's facility to complete her treatment. At Magee, a different radiation oncologist was consulted and was reviewing the patient's treatment scans/images and discovered that the treatment in October at the licensee was 3 cm off and the small intestine received the dose. It was discovered that the patient required re-suturing of the cervix and that the cylinder (used in the HDR treatment) passed beyond the apex of the vagina. This discovery was made on December 9, 2021. The medical physicist is currently calculating dose estimates. The referring physician has been informed.