AECU-3613

A SUMMARY OF TRANSPORTATION INCIDENTS

IN

ATOMIC ENERGY ACTIVITIES

1949-1956

Safety and Fire Protection Branch
Division of Organization and Personnel
U. S. Atomic Energy Commission
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This document presents the facts surrounding the serious transportation incidents reported in the Atomic Energy Commission and its contractor operations from 1949 through 1956.

It has been compiled as a result of frequent requests for information concerning transportation incidents, particularly those which involve radioactive materials.

SHIPMENT ACCIDENT

Nature of Incident

A runaway truck loaded with sand hit two AEC trucks.

Description of Operation

AEC truck convoy shipment.

Details of Incident

The private vehicle coming from the opposite direction (of the AEC trucks) ran through a dead end intersection at a speed of approximately 50 MPH, striking two Federal vehicles which were making left turns to come out onto the main highway leaving town. The private truck hit the first AEC vehicle on the left side, tore off the box (see photograph), continued on, hit the second truck and turned it around, and continued through a stone wall coming to rest at the base of a tree.

Nature of Injuries or Loss

The first AEC truck was damaged beyond repair and the other AEC truck was damaged only on the front end. Two people were injured; one with a wrenched shoulder, the other with facial lacerations. None was hospitalized.

The cargo was undamaged.

Santa Fe, New Mexico
November 14, 1949

AIR CARGO SHIPMENT CRASH

Nature of Incident

Cargo air service aircraft crashed with a pilot and two AEC Security Guards aboard.

Description of Operation

The aircraft was being operated as a contract cargo flight for the U. S. Government.

Details of Incident

The cargo plane started to make the pre-planned approach to a landing strip and during this encountered a scud. The pilot decided to try a different approach. The aircraft circled around the mesa and in doing this the craft hit one of the steep slopes and crashed in an upright position. The plane was completely demolished by the impact and subsequent fire.

Nature of Injuries or Loss

The three aboard were killed and the plane demolished. The classified material was removed from the wreckage.

Remarks

Inspection of the aircraft and engine logs indicated the aircraft was well maintained.

Close inspection of the wreckage revealed no structural failure to the aircraft or malfunctioning of the controls or engine prior to the impact.

Nr. Albuquerque, New Mexico
February 11, 1950

URANIUM BILLETS SHIPMENT ACCIDENT

Nature of Incident

Semi-trailer truck loaded with uranium billets skidded off an icy road.

Description of Operation

Uranium billets being transported by truck from railroad station to plant.

Details of Incident

A 10-ton semi-trailer truck containing 3 tons of uranium billets was being driven by AEC part-time driver on an unused icy road covered with snow. The truck skidded at a 90° turn and hit a tree. The impact of the trailer hitting the tree disengaged the tractor and caused the entire load of billets to slide through the rear of the tractor cab, seriously injuring the driver and pinning him in the cab.

Nature of Injuries or Loss

The driver received severe shock and several broken ribs and was taken to the hospital in critical condition but recovered.

All of the material was accounted for and undamaged.

Remarks

Angle iron frames were welded to the body of the trailer to prevent the recurrence of this type of accident.

Lockport, New York
February 9, 1951

TWO-FATALITY COLLISION

Nature of Incident

Head-on collision of two AEC contractor-owned and operated 5,000-gallon water tank trucks (one filled and one empty).

Description of Operation

Hauling water by tank trucks between water source and plant.

Details of Incident

Due to the absence of witnesses and the fact that both drivers died instantly in the tangled wreckage (see photograph), a satisfactory answer to the cause of the accident has not been determined.

The trucks collided head-on on a 20 foot paved road with sound 5' gravel and sand shoulders. The on-coming loaded truck weighed 35 tons; the empty one about 15 tons. There was no evidence that brakes were applied on either truck or that a blow-out occurred before the collision; nor were there any indications that an attempt had been made to avoid the collision. Dust may have been involved.

Nature of Injuries or Loss

Two fatalities resulted from the collision and total property damage amounted to \$42,000.

Remarks

As a result of this accident, more stringent control measures have been put into effect. Speed of trucks has been reduced to 25 MPH when passing other vehicles. Road patrols under increased surveillance will spot violations and make immediate reports to the contractor personnel responsible for the equipment.

Nevada Test Site
July 27, 1951

A PRIVATELY-OWNED TRUCK SKIDDED INTO A AEC TRACTOR-TRAILER TRUCK

Nature of Incident

Parked AEC tractor-trailer truck hit by a private truck out of control.

Description of Operation

Shipment by truck between two AEC plants.

Details of Incident

AEC tractor-trailer truck going north had pulled off the pavement and parked at a restaurant. A driver of a privately-owned tractor-trailer truck lost control of his truck going south around a curve. His vehicle left the road approximately 162 feet from the AEC vehicle. The right front fender and wheel of his vehicle collided with a telephone pole and sheared it off even with the ground. Upon impact with the telephone pole, the tractor was knocked back towards the highway. The right rear wheels of the tractor hit the Government vehicle (see photograph).

Nature of Injuries or Loss

The occupant of the AEC vehicle received bruises on the right leg. Damage to the AEC truck was about \$2000.

The cargo was undamaged.

Near Walton, Kentucky
May 20, 1952

FIRE IN A TRUCK LOAD OF URANIUM METAL

Nature of Incident

A truck load of solid pieces of uranium metal was involved in fire (see photograph).

Description of Operation

Solid pieces of uranium metal were being transported by truck between plants.

Details of Incident

The truck was involved in a vehicular accident and fire resulted from rupture of the truck's gasoline tanks. The fire started to spread to the cargo which was in wooden crates. A local fire department responded but was instructed to use no water. The guards with the truck had received these instructions. At one time, it was thought that such a fire could not be fought with water. The instructions had been changed but the two men concerned had not yet attended the training class.

The fire spread through most of the cargo prior to the arrival of an AEC contractor fire department which extinguished the fire with water.

Remarks

It is well established that uranium in finely divided form or in small pieces such as machine scrap is pyrophoric. Research is under way to determine basic information in the field of uranium pyrophoricity. It is uncertain whether massive uranium metal will sustain combustion but this fire proves that massive uranium must be protected against exposure to external fire. In the case of both scrap and massive metal, the "ashes" (uranium oxide) can be recovered for reprocessing. But the loss can be much higher in machined metal due to the fabrication steps which have taken place. Radiation contamination from a normal uranium fire is negligible.

Near Kansas City, Missouri
October 29, 1952

AIRPLANE CRASH

Nature of Incident

An aircraft crashed with two personnel aboard, a geologist-observer and pilot.

Description of Operation

Conducting a normal low-level gamma radiation survey flight.

Details of Incident

The aircraft flying down a valley, while traveling in a north-northeasterly direction, encountered two power lines. At the moment of contact, short circuiting occurred and the air was filled with a flurry of blue sparks. The plane slowed down momentarily and then continued down the valley veering slightly to the left. After traveling an estimated 400 yards along this path of flight, the plane began to settle. At this time, the pilot warned the observer that an emergency landing would be made. Immediately thereafter the aircraft entered an Aspen grove and upon being deflected by the trees came to rest on the nose and the main gear (see photograph). The observer quickly removed his shoulder harness, kicked open the door, which was jammed, untangled himself from the aircraft and assisted the pilot. The pilot's legs were pinned beneath the crushed instrument panel and, with the impending danger of fire from the gas that poured from the ruptured left tank on the hot engine, he was hurriedly pulled free.

Nature of Injuries or Loss

The pilot received lacerations and abrasions on his legs and face. The geologist was not injured. The total loss to the aircraft was \$4,636.

Near Aspen, Colorado
September 28, 1954

UNH SOLUTION SPILL

Nature of Incident

Over 1,500 gallons of uranyl nitrate hexahydrate solution spilled (see photograph) when a tank trailer overturned.

Description of Operation

An intra-plant transfer of UNH was being made in a tank trailer. Before starting out, the driver routinely tested the air brakes and found that those on the trailer were not working. In spite of this, he decided to go ahead with the trip.

Details of Incident

En route, he applied the tractor brakes to maintain control of the unit on a downhill grade. The trailer swerved left and right until it overturned.

Immediately after the spill, the road was blocked off. The fire department washed all the material from the road into a drainage ditch. This ground was dug up and removed for reworking. Not only was a large percentage of the uranium recovered, but the radiation level was reduced to a point where no controls were necessary on the road. Within four hours after the accident the road was reopened.

Nature of Injury or Loss

Damage to the equipment, salvage, recovery, and loss of material cost approximately \$59,000. No one was injured.

Remarks

The following factors seem pertinent:

1. Design of the tank trailer incorporated a high center of gravity and difficult front suspension with susceptibility to overturning, which had been overlooked when design was approved by AEC and contractor's safety departments.
2. Although the driver is a qualified heavy duty truck and trailer operator, this was his first trip with this trailer.
3. He was aware of the standard practice which prohibited use of defective equipment.

UNH SOLUTION SPILL (Continued)

4. He also knew that delivery of the load was desired promptly.
5. He elected to go without trailer brakes, believing he could make the trip safely.

Action taken:

1. The operator was disciplined for violation of an established safe operating practice.
2. The tank was mounted on a 25-ton lowboy for increased equipment stability in over-the-road operation. Practical type and design of equipment for this work is being studied.

Hanford, Washington
December 30, 1954

VEHICLE SHIPMENT FIRE

Nature of Incident

A tractor-trailer shipment caught fire while en route to an AEC area.

Description of Operation

A shipment being hauled between AEC plants by truck.

Details of Incident

The fire started while the vehicle was moving and was observed by the driver in his rear vision mirror. The driver immediately pulled the truck to the side of the road and stopped. The driver and the escort driver (who was following him) attempted to put the fire out by using a portable extinguisher which was in the vehicle. They were unable to get to the seat of the fire because of the heavy metal housing surrounding the tank where the fire was located. They then concentrated upon separating the tractor from the trailer. The tractor driver then drove the tractor about 75 feet away from the trailer. It was concluded that ignition of gasoline vapor escaping from the right hand fuel tank enclosure by sparks, or hot gases escaping from a defective exhaust pipe connection at the muffler, was the probable cause of the fire.

Nature of Injuries or Loss

Due to the efforts of both drivers the trailer and its cargo were not damaged. The tractor was damaged considerably (\$3,000).

No personal injuries resulted from this incident.

Remarks

The fact that there was no explosion of the fuel tank during this fire is an excellent demonstration of the value of properly designed fuel tanks.

(Photograph attached.)

Near Williamsburg, Kentucky
August 14, 1955

URANIUM HEXAFLUORIDE (UF₆) SHIPMENT VEHICLE ACCIDENT

Nature of Incident

AEC trailer-truck tipped over in going around a curve.

Description of Operation

UF₆ shipment between plants.

Details of Incident

AEC tractor-trailer hauling a container of slightly radioactive material tipped over going around a curve. The accident resulted in no hazard to the surrounding area. However, since the material in the container was slightly radioactive, the scene of the accident was roped off to prevent close approach to the container.

Nature of Injuries or Loss

The load consisting of a 10-ton cylinder of depleted UF₆ was damaged. The driver received minor injuries.

Bardstown, Kentucky
October 26, 1955

RAILROAD CAR CONTAINING SCRAP URANIUM DEMOLISHED

Nature of Incident

Train derailed (see photo); one car contained scrap uranium.

Description of Operation

Scrap uranium was being transported between plants by rail.

Details of Incident

A train which contained a carload of scrap uranium was derailed by a rock and snowslide. The car containing the scrap uranium was demolished and the contents spilled on to the right-of-way. Radiation detection instruments were used in locating the material.

Nature of Injuries or Loss

Loss involved 60 lbs. of uranium scrap believed to be buried under the earth and rock. There was no radiation exposure to personnel.

Remarks

All the material involved, with the exception of the 60 lbs., was recovered and it was determined that further search for the unrecovered scrap was not economically justifiable.

Between St. Maries and St. Joe, Idaho
March 24, 1956

DERAILMENT OF FREIGHT CAR TRANSPORTING A URANIUM COMPOUND

Nature of Incident

Train derailed (see photo).

Description of Operation

Transporting drums of uranium compound by rail.

Details of Incident

Twenty-six cars of a freight train were derailed as a result of a broken rail. The car containing the uranium compound was immersed in a river. The car was removed from the river bed intact and all the material was recovered.

Nature of Injuries or Loss

The material was not highly radioactive and no health hazard was involved.

Western Montana
April 20, 1956

INTERPLANT SHIPMENT ACCIDENT

Nature of Incident

Trailer-truck overturned and caught fire.

Description of Operation

Transportation of slightly radioactive material.

Details of Incident

The braking system reportedly failed on a downgrade and the driver lost control of the unit as he attempted to negotiate an "S" curve. The vehicle skidded across the highway into a soft ditch, plowed up the shoulder for approximately 100 feet, then up an embankment on the left side of the road, overturned, and burned (see photographs).

Nature of Injuries or Loss

The driver was hospitalized for burns and bruises resulting from the accident. There was no loss of material.

Monterey, Tennessee
July 9, 1956

SPONTANEOUS MASSIVE THORIUM FIRE

Nature of Incident

A spontaneous fire occurred in a drum of thorium metal pellets en route to an AEC licensee.

Description of Operation

Railroad shipment of thorium pellets.

Details of Incident

The shipment arrived at the Railway Express Agency warehouse where it was loaded onto a truck for further transport. A few minutes after loading the truck, smoke was noted rising from the load. The source of smoke was found to be a drum which was pushed from the trailer and allowed to burn itself out. The fire lasted about $2\frac{1}{2}$ hours.

Nature of Injuries or Loss

No one involved in the incident received any exposure to thorium or radiation in excess of maximum permissible amounts.

Detroit, Michigan
September 22, 1956

RADIOACTIVE SHIPMENT ACCIDENT

Nature of Incident

Semi-tractor-trailer truck loaded with two casks containing radioactive slugs went over an embankment.

Description of Operation

The slugs were being transported between plants by tractor-trailer.

Details of Incident

On a rainy morning (temperature 26°, resulting in a glazed road) a semi-trailer was coming out of a downgrade "S" curve when the trailer started slipping toward the right on the outside of the curve. In the next 150 feet, the trailer went over the bank (see photograph) and was dragging behind the tractor which was maintaining traction on the shoulder. The weight on the trailer (21 tons) was straining on the king pin and fifth wheel and, as the trailer slipped further down the 25° slope, the fifth wheel tore loose from the tractor causing the tractor to flip over on its right side. The trailer started rolling down the embankment. The rear cask broke loose during the roll and stopped in an inverted position on a shelf about 30 feet below the road surface. The trailer continued rolling to an upright position where it stopped with the forward cask still secured to the bed although it had slipped to the left about 12 inches and flattened the stainless pan side.

Nature of Injuries or Loss

Neither the driver nor the relief driver was seriously injured; the latter was sent to the hospital for observation.

An instrument survey was made of the equipment, area, and personnel. All slugs remained safely in the casks.

Pleasant Valley, Oregon
December 11, 1956