

 Report from a French incident**Contamination of the floor of a vehicle during the transport of radioactive waste****Description of the incident**

The incident occurred during the transportation of 60 packages containing radioactive waste from hospitals and research sites. After unloading the waste, measurements revealed contamination on the floor of the truck.

Transport company A is responsible for collecting the waste packages over a wide region. The majority are then transported to a storage center B; the others (approximately 10 per cent of the waste), comprising packages of frozen waste that may not be packaged in polyethylene drums, is sent to company C.

The sequence of events was as follows:

- The driver of a company A truck delivered 10 packages of waste matter to company C. After unloading, the driver noticed that the frozen waste drums had left traces of moisture on the floor of the vehicle, from the condensation on the packages.
- Two hours later, the vehicle went to Company B to deliver the 50 remaining parcels. Upon opening the back door of the vehicle, the driver found that a cylinder was lying in the vehicle, due to the movement, during the first unloading, of the props used for stowing packages.
- The driver picked up the cylinder without realizing that a few drops of liquid had been released and had contaminated the floor of the vehicle. The weight of the cylinder upon arrival was identical to its weight upon departure. When unloading, a few drops of contamination were mixed with the residual condensation left by the first delivery.
- At the end of the unloading, company B's radiation protection supervisor highlighted a contamination of the floor of the vehicle. The cylinder in question contained liquid waste of an activity of 4.3 GBq mainly due to carbon 14 and tritium. It was a cylinder type¹ which is no longer produced, but is sometimes still used by smaller waste producers.

Radiological consequences

The radiological checks (using smears) after unloading revealed a removable surface beta contamination level on the cylinder of 60 Bq/cm², and 10 Bq/cm² (average) and 60 Bq/cm² (maximum) over the vehicle floor (area 5 m²).

The contamination was confined to the vehicle and the cylinder, and the radiological surveys carried out on the handler who carried out the unloading revealed no surface contamination. No analysis of urine was performed.

¹ The decanting of liquid waste from these old cylinders into new containers entails a significant risk of contamination, as well as the risk of inhaling contaminated solvent vapors; it was, therefore, decided not to transfer waste from the old containers.

Lessons to be learned from the incident

The following recommendations were made:

- To carry the "old model" cylinders in an overpack (a metal drum, for example) which would provide additional containment.
- Positioning the cylinders in full walled crate pallets to ensure good propping.
- Respect the filling level of the cylinders, specifically, the older models.
- After unloading a portion of the packages, the carrier must verify what remains in the vehicle before restarting; he must ensure the proper stowage of the remaining packages.
- Although, in this incident, the origin of the contamination was established, the carrier should have investigated the traces of humidity left by the frozen packages during the first unloading, and verified that no contamination was present before proceeding.