

 Report from a French incident**Hospital waste triggers radiation alarm at incinerator plant****Description of the incident**

The portal radiation detection alarm (set at 2.5 times background) at an incineration centre was triggered by the passage of a dump truck carrying hospital waste. The container in which the radioactive waste was located was isolated and placed away from the incineration centre buildings.

The next day, the regulatory authorities, contacted by the person responsible for the incinerator, intervened to carry out a radiological check of the container. The dose rate in contact with the container was up to 160 $\mu\text{Sv/h}$.

Some fifty bags of waste were then taken out of the metal container and checked individually using a radiation meter. This resulted in the isolation of two bags, which gave the following readings:

- First bag: 1010 $\mu\text{Sv/h}$ in contact, and 18 $\mu\text{Sv/hr}$ at 1 metre.
- Second bag: 70 $\mu\text{Sv/h}$ in contact, and 1 $\mu\text{Sv/hr}$ at 1 metre.

Qualitative analysis identified the radioactivity as iodine-131.

The hospital that produced the waste (urine) was identified, but it did not have a nuclear medicine department. The investigation revealed that the waste did come from a patient at this hospital, but who had received I-131 for his thyroid disease in the nuclear medicine department of another hospital. The patient returned to the original hospital a few hours after his treatment.

The nuclear medicine department had recommended (in writing) that the hospital collect waste from the patient for the first three days after treatment, and to decay and store it for 7 days. However, waste was handled in the usual manner and transferred to the incinerator two days before the scheduled date.

The two contaminated bags identified were returned to the nuclear medicine department and kept in their decay store for the required time.

Radiological consequences

The dose rate measured upon contact with the bags of waste was not insignificant, but it is estimated that doses were likely to be very low (at most a few 10's of μSv) to the persons involved in handling the waste. However, had the waste been stored close to routinely occupied areas, the doses could have been much higher (several mSv), and above the public dose limit of 1 mSv/y.

It can be estimated that in one work day, a person whose desk, would have been installed in the vicinity of the closet under which the source was recovered, could have been exposed to a hundred msv to the whole body (reminder: the limit for the public is 1 mSv).

Fortunately, there were no desks near the closet and there had been no radiological effect as a result of this incident (or on the people, or on the environment).

Lessons to be learned from the incident

Any establishment receiving a patient that has undergone a nuclear medicine procedure must be informed of any precautions to be taken with respect to radiation protection, and the storage and disposal of any radioactive waste arising. This information should be prepared by the nuclear medicine department and attached to the patient's file. Equally important is that these instructions are observed, and it should be ensured that all relevant persons have appropriate instructions and training.

Where there are requirements associated with the disposal of radioactive waste, appropriate equipment and procedures for monitoring the waste should be available. This is becoming more important as the number of portal detectors at incinerators and other waste receiving sites increases. These portals are often set at very low alarm thresholds, and waste suppliers and receivers should, where possible, co-operate so that the number of incidents is reduced.