Report from a French incident

Disappearance of an Iridium 192 wire from a hospital

Description of the incident

A hospital technician was preparing to use an Iridium 192 (Ir-192) wire for the treatment of a patient when he found that it was missing from its usual storage place in the gamma source repository. Various search operations and investigations were then carried out :

First:
- The source records, produced by the center's radiological physics unit, were checked.
- The iridium wire movement register, completed by the unit nurses for each patient treated and then validated by the radiological physics unit, was also checked.

These checks do not lead to the recovery of the Iridium wire.

Second, a search with radiation detectors is carried out. Steps include:
- The radiotherapy simulation room and adjoining corridors are checked.
- An interview with the person who worked in the wire storage area is conducted. Nothing suspicious is reported.
- The head of housekeeping services is contacted, and all the housekeeping carts throughout the entire hospital are checked.
- The operating theatre changing room is checked.
- The manager of the cleaning company is contacted, and all cleaner rooms are checked.
- The box in which the iridium wires were stored was dismantled, to check that the wire had not slipped into a groove.

None of these checks lead to the disovery of the wire. Instead, it was found the next day following the triggering of a radiation alarm at an incineration plant (during the passing of a truck loaded with waste).

The Iridium wire was recovered by trained firemen, then packaged and placed in a suitable store.

Radiological consequences

There was no direct evidence of persons having been exposed by the source. However, some exposures must have been received by persons moving the waste from the hospital.

The dose rate in contact with the source was 4.4 mSv/h, and 0.03 mSv/h at 1 metre. If a person had found this wire by chance outside its usual storage area, and had picked it up and placed it in a trouser pocket for a working day (8 hours), the estimated effective dose is approximately 35 mSv (as compared to public dose limit of 1 mSv/y).

Lessons to be learned from the incident

- In this case, a review of the source records (which is an appropriate first step) failed to assist in the discovery of the missing iridium wire. The systems for controlling and accounting for the movement of radioactive wires in hospitals must be rigorous. The source records should be updated at the point of movement, and not retrospectively as this could lead to oversights. In addition, regular verification of these records should be undertaken to ensure they are accurate.
- The loss of the source could have been rapidly identified, and it's removal from the premises prevented, by fixed radiation detectors installed at key locations around the department.