

## STUDY CASE N° 7: RADIOGRAPHY INCIDENT IN FRANCE

*European ALARA Newsletter – Issue 5*

### ❑ Description of the incident

In February 1995, a team of two radiographers was executing the inspection of welds on a construction site, by night.

The equipment being inspected was an upright gas tank, with a diameter of 8 m and open at both the bottom and the top.

This base was 1 m above the ground on temporary supports, so that the radiographers could move easily from outside to inside of the structure. The weld to be inspected was at 10 m above the ground which called for scaffolding and safety ladder.

The exposure device, containing 2,7 TBq iridium-192 was manually remote controlled from outside the base of the tank. For greater convenience, it was tightly fixed onto the scaffolding hand rail with a rope and 4 or 5 knots! The 3 m projection sheath was positioned at the correct distance from the weld with a specially adapted rigid tool (2 magnets, each of 80 kg magnetic strength!).

At the start of the exposure, the radiographers heard the noise of the magnetic support falling on the scaffolding floor. It was 2 a.m, pitch dark and they had only portable lamps and usual radiation monitors. There was no operating phone on the site, and after study of the situation, the two radiographers, without the possibility of ready contact with their management, decided to retract the source. This was not successful as the projection sheath was severely bent. So, they decided to take down the radiographic system in its totality, to straighten the sheath and finally to retract the source into the exposure device. One of the radiographer had to go up and down 3 times for this purpose. It took about 30 minutes to recover the source.

A subsequent investigation by the radioprotection safety manager assessed the doses to be approximately 38 mSv for the operator who went up and down the ladder 3 times (the last time with the equipment in his hand), and 8 mSv for the second one who had remained down stairs. These results are in agreement with the films badge results (which were a little bit higher, but included the exposures for the rest of the month).

### ❑ Lessons learned

- 1) The high dose in this incident resulted from poor planning, both in respect of how the work was undertaken (without due consideration of what could go wrong and the implications) and of the actual recovery operations. Management instructions should require the radiographers to estimate doses from proposed recovery operations and should set an action level above which the advice of management should be sought – however difficult this may be.
- 2) Magnet fixing systems must be easily and automatically disconnected from the ejection sheath in case of accidental situation (the system is now developed).
- 3) No rope nor knot for fixing the gamma source equipment.
- 4) Mobile phone should be available on the site (especially at night) to summon assistance.