



Report from a UK incident

Loss of Po-210 static eliminator sources - 2 examples

Description of the incidents

Incident 1

During a visit to a factory to replace a number of polonium-210 static elimination sources, the supplier noted that one of the original sources (containing 440 MBq of polonium-210) was missing. The management was informed and advised to investigate the loss and, if necessary, notify the competent authority.

The investigation concluded that the anti-static bar had probably become dislodged from the machine during use and unknowingly fallen into a waste collecting bin beneath. The contents of the bin were probably disposed to landfill. During a review of the company's records it became clear that other sources could not immediately be located. It was finally concluded that the above source and one other 370 MBq polonium-210 source had been lost, and that both sources were disposed with factory waste to landfill.

The investigation also revealed that the Radiation Protection Supervisor had left the company some time before the incident and that no one at the company was trained in radiological protection and the regulatory requirements for using radioactive materials.

Incident 2

A 1 metre long static eliminator bar installed in a factory was due to be exchanged. Prior to the exchange, the replacement bar (containing 3 GBq of polonium-210) was stored in a locked steel cabinet in the production area office. The cabinet was labelled with radiation warning trefoils.

However, the cabinet went missing - the Radiation Protection Supervisor was contacted and a search of the premises was instigated. An investigation revealed that the cabinet had temporarily been moved to another area during office refurbishment some weeks before. Subsequently, employees had been requested to clear this other area and remove all rubbish to a skip.

The incident was reported to the Radiation Protection Adviser and the regulatory authorities. It transpired that the cabinet and source had been placed in a skip designated for the disposal of scrap metals. The skip had been removed by a scrap metal dealer and its contents crushed before transportation to a distributor. It is not known where the material was subsequently sent, or whether it was recycled or sent to landfill. Measurements at the distributor's premises showed no evidence of radioactive contamination.

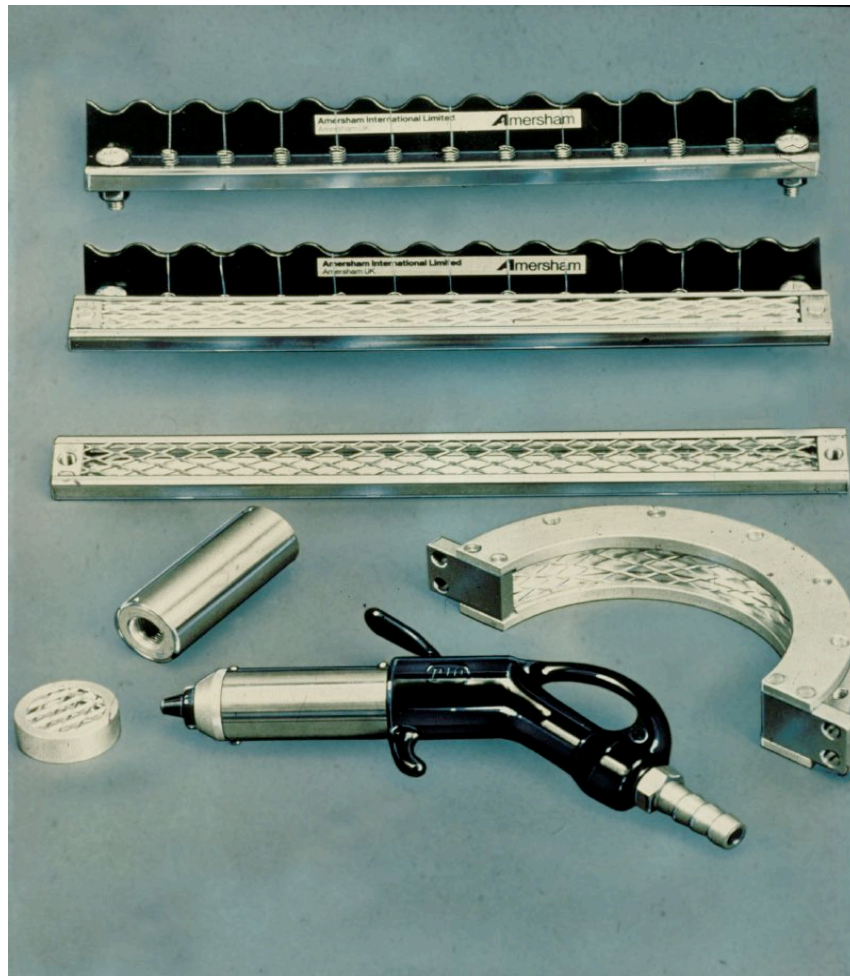
Radiological consequences

Given the uncertainties about the fate of these sources, no precise estimates of radiation exposures are possible. However, the general conclusions were:

- The exposure of employees at the original sites should have been negligible.

- To exposure of persons in the subsequent supply/disposal chain are less certain, but would have been expected to be very low.
- The radiological consequences of accidental disposal to landfill are expected to be very low.
- The recycling of scrap metal could have resulted in a release of polonium-210 to atmosphere. A preliminary assessment suggested that radiation exposures from such a release (eg from a furnace stack) would be low.

Examples of polonium-210 anti-static sources



Lessons learned

- Radioactive sources that are installed on industrial premises should be firmly attached to the machinery, and clearly labelled. All such installations should be subject to periodic inspection and maintenance.
- The location of all such radioactive sources should be positively verified on a regular basis. This is even more important where sources are not fixed to machinery, eg because they are awaiting installation, or have been removed for maintenance or disposal.
- Source security is of paramount importance and companies should consider the fixing of source storage cabinets in such a manner as to prevent their accidental removal (following incident 2 the new storage cabinet was bolted to the floor).

- When staff changes occur it is essential that all roles are reviewed and appropriate appointments made by management. In incident 1, the implications of the departure of the Supervisor were not recognised by management who themselves were untrained in the requirements for the safety and security of radioactive sources.
- Where radioactive sources are used on industrial premises, adequate information should be given to other employees (ie who do not work directly with the sources) to enable them to recognise the potential hazard.