

STUDY CASE N° 14: TRANSPORT OF GAUGES FROM A REFURBISHED BREWERY

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❑ Description of the incident¹

As part of a refurbishment programme in a brewery, four liquid level gauges, each containing a 3.7 GBq americium-241 source, were removed from a production line to safe storage prior disposal. The sources were beyond their useful working life and as a consequence were no longer covered by a Special Form Certificate, thus requiring a Type B container to transport them. The Am-241 source assembly of each gauge was sandwiched between stainless steel plates, attached to which were a shutter mechanism and mounting bracket. The radioactive material was incorporated within a thin-walled, stainless steel tube.

The company that was contacted to dispose of the sources brought only one Type B container to site. The contractor intended to dismantle the gauges on the site and transport all four Am-241 sources in one trip. It was discovered that source assemblies, which were each about the size of a 13- amp fuse, were fixed in place with adhesive. The contractor's employee prised them out of their housing using screwdriver and placed them in the Type B container. The sources were damaged in the process. The work was carried out in the back of a small van in the visitors' car park of the brewery, adjacent to a busy main road. The van driver then went to a second location about 100 miles away to collect some more equipment for disposal before returning to base. A few days later, it was discovered that both the container and the van itself were contaminated with Am-241. Subsequent monitoring revealed that the contamination was rather more extensive, and included other vehicles and properties. The company reported the incident and a detailed investigation commenced. The investigation showed:

- a) The contractor did not discuss the job with the brewery or their RPA and had inaccurate information about the size of the gauges;
- b) Alternative methods of work had not been considered; and
- c) There was doubt about whether the available radiation monitoring instrument was capable of being used – when the specialist batteries of the radiation monitor were checked some days later these were found to be flat.

❑ Radiological Consequences

The doses involved were primarily from intakes of americium-241 and the committed effective dose equivalents were estimated to be 20 mSv and 2 mSv for employees of the disposal contractor and less than 1 mSv for the wife of the former.

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Taken from the IRID database

❑ Lessons learned

- 1) Equipment holding radioactive sources should, wherever possible, be transported with the source undisturbed to suitable facilities before dismantling takes place;
- 2) Where removal of sources on the site is unavoidable, close liaison between the companies (and their respective RPAs) should take place with a view to ensuring that adequate facilities are available for the work to proceed safely;
- 3) Local rules should clearly and unambiguously state what should be done (or not done) if conditions change during the work;
- 4) Contingency plans should be incorporated into local rules, made known to relevant employees, and practiced;
- 5) After source manipulations appropriate monitoring should be undertaken. In situations such as this, contamination should always be considered possible; not just from the manipulation procedure, but also due to degradation of the source integrity due to the environment.
- 6) Means should be provided for the checking of radiation monitoring instruments on-site before each use (e.g. check source). Spare batteries should be carried with equipment.