



Entry into Co-60 radiography enclosure with source exposed

Description of the incident

An industrial radiographer became confused about the shielded status of a 300 GBq (8 Ci) cobalt-60 source whilst working in an enclosure. He was using a portable projection-type container with a manual exposure system – however, he ended up exposing the source, when he thought he was retracting it into the container. Consequently, he entered the enclosure to change films when the source was exposed (and entirely uncollimated). He was wearing a personal alarm but this was not working.

The enclosure had previously been fitted with a trapped key system to prevent access unless the source was fully retracted into the container. However, three years earlier the company had purchased a new source container that was not compatible with this system. The use of the trapped key system was stopped. Instead a fully independent wind-out mechanism was used to expose and retract the source.

Following the incident, the company installed a gamma alarm in the radiography enclosure and has modified the trapped key system to make it compatible with the source container. Thus, access the enclosure is no longer possible unless the source has fully retracted into the shielding container.

Radiological consequences

The radiographer received a whole body dose of 9.4 mSv.

Lessons learned

- The incident would not have occurred if the radiographer had used a radiation monitor to ensure proper retraction of the source at the end of each exposure.
- Personal alarms are recommended (and should be tested and maintained in good working order) for industrial radiographers (where working in enclosures or not). The installation of an automatic radiation alarm inside radiation enclosures can also add significantly to the level of safety. However, neither of these are a substitute for a dose rate meter used after every exposure.
- Whenever new radiation sources or associated equipment are installed or modified, the aim should be to at least maintain, and preferably improve, the existing standard of radiation protection. In any case, a critical examination should always be carried out to ensure that the safety of the whole system is acceptable.