Report from a French incident

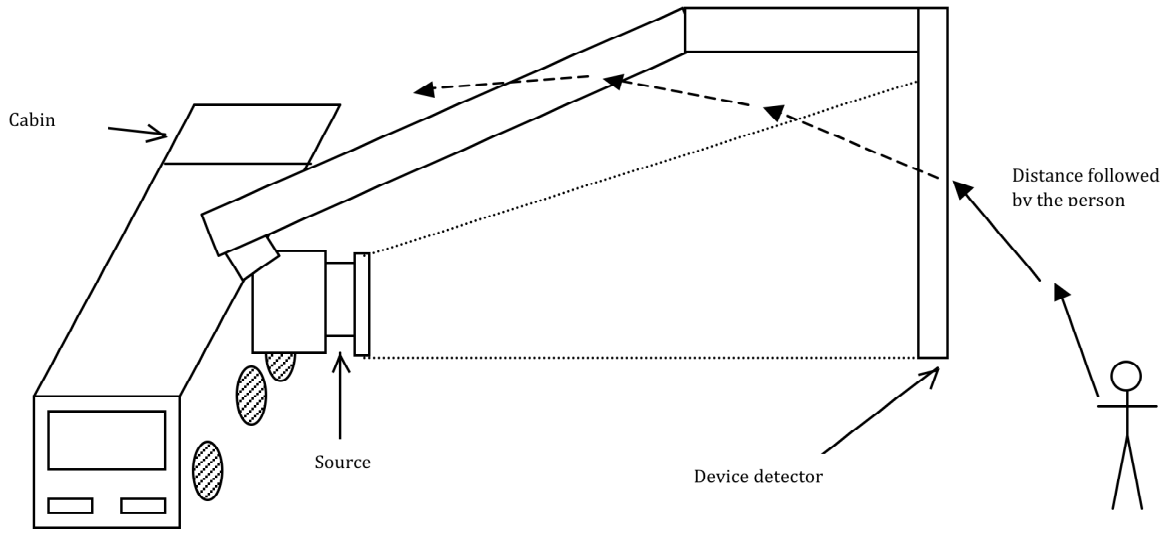
Exposure due to a mobile freight fluoroscopy device

Description of incident

Company A specializes in the radiographic inspection of merchandise and freight. For this, it uses a mobile X-ray set up, assembled on a motorized vehicle (HCV-Mobile). The day of incident, the mobile fluoroscopy vehicle was on company A property but outside the buildings and without any markings or demarcation of the area.

A person who worked for a neighboring company was in the vicinity of the freight X-ray system while it was in operation. No employee of Company A was present at that time. The only indication that the unit was in operation was some red lights: there was no audible signal.

The person followed a path that led them to walk alongside the Mobile-HCV at approximately 3 metres from the device's detector (see diagram), entering the controlled area for an instant. Upon arriving close to the cabin, the person then crossed the light beams delimiting the secure zone, which resulted in the interruption of the X-ray emission. The detector column was shielded, and the person did not cross the direct X-ray beam.



Radiological consequences

Following the incident, a dose assessment was performed based on the above description (a total of 6 minutes occupancy time). The estimated dose was 0.36 µSv.

Measurements under real operating condition were carried out at various points. In fact, for a point situated 3 metres to the left of the source, the dose rate was 150 µSv/hr, likely to be the result of a slight leak.

Incidents on this type of device only rarely lead to high doses. However, these devices which are used in the control of goods, freighters, or of luggage in airports are likely to

expose a large number of persons when radiation protection measures, often simple, are not implemented.

Lessons to be learned from the incident

Although in this incident the dose was very low, it is quite possible that higher exposures could have been received if the pattern of exposure were different. Simple measures that would help to avoid these exposures include:

- Ensuring that the perimeter of the controlled area is fully demarcated (by physical barriers or light beams), and marked with suitable warning signs (including “do not enter”) at all potential points of entry.
- The above demarcation is only effective if it has been verified, monitored and supervised in order to avoid it being crossed by onlookers or other workers.
- During the operation, an operator should always be present to terminate the exposure in the case of any incidents such as this.
- Audible signals when the device is in operation would draw it to the attention of persons attempting to enter the area.