

RADIATION INCIDENT INVOLVING AN X-RAY FLUORESCENCE
SPECTROMETER

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An incident will be described in which a scientific officer received a high absorbed dose, from an x-ray fluorescence analyser, to three fingers of one hand resulting in injury to two of them. The absorbed dose to the long finger was 213 Gy, to the index finger it was 134 Gy and to the thumb 17 Gy. The two fingers were relatively uniformly exposed while the thumb was exposed over a small area. The two fingers suffered permanent injury while the thumb appears to have recovered.

The paper will cover the incident, its investigation and the dosimetry used to assess doses received. The remedial action taken to prevent a repeat of the incident will also be given.

This particular incident came about on the one hand as a result of an operator trying out a new procedure without having first carried out a safety check, and on the other hand, as a result of safety requirements recommended by the manufacturer not having been adopted.

The main conclusions drawn from the incident are:

- 1) x-ray fluorescence equipment with all its in built safety features is not automatically safe;
- 2) new or novel procedures should be carefully investigated before being tried out; and
- 3) as has previously been found, fluorescence analysers can deliver high radiation doses in a very short time.