



Report from a UK incident

Radiation injuries received by newly installed dental x-ray set

Description of the incident

An unsatisfactory installation of a new dental x-ray set led to a dentist suffering radiation injuries. The x-ray set had been installed in such a manner that it operated continuously at any time that it was switched on, but this was not noticed by either the dentist or the installation engineer.

The dentist spent about 90 minutes close to the x-ray tubehead as he familiarised himself with the equipment in his new surgery. He then noticed that the tubehead was hot and switched it off.

A few days later the equipment was switched back on to take a radiograph of a patient. Almost immediately, the tubehead exploded, spreading oil and debris across the surgery, narrowly missing the patient in the chair at the time.

Radiological Consequences

A few days after the above sequence of events, the dentist developed skin lesions on his right shoulder and in his mouth; there was also temporary opacity of his right eye. The subsequent investigation concluded that the dose to his right shoulder was around 20 Sv. Chromosome aberration analysis indicated that his whole body dose was about 240 mSv. The dental nurse present at the time was likely to have only been exposed to scattered radiation and her dose was probably 0.2 mSv or less.

Lessons learned

Incidents of this type are not unknown, but this particular incident is likely to have been one of the most serious to have occurred involving dental x-ray equipment. The subsequent investigation led to a new National Code of Practice being published, recognising the need to reduce the risk of simple electrical faults that may have serious consequences.

Engineers installing equipment must have received sufficient training in their duties and also the requirements of the relevant radiation safety regulations.

Equipment must be tested during the installation process to ensure that it has been correctly installed and all safety and warning systems operate correctly.

All the above requirements have been incorporated into the national legislative structure by way of a licensing procedure for all users of equipment which emits ionising radiation.