Protecting people
Preventing harm
Preparing for threats

Ionising Radiation and How We Are Exposed to It

Ionising radiation is the energy produced from natural and man-made radioactive materials. It is present in the environment because of naturally occurring radioactive minerals remaining from the very early formation of the planet. This leads to exposure to gamma rays and radioactive radon gas from certain rocks and from radioactive material in our food and drink. We are also exposed to natural ionising radiation that comes from outer space and passes through the atmosphere of the planet - so-called cosmic radiation.

There are three main sources of man-made ionising radiation. First, it is used in medicine for treating cancer and for the diagnosis of many diseases. Second, radioactive materials are also used in industry, primarily for measurement purposes and for producing electricity. Both medical and industrial uses of radiation produce radioactive waste. Third, it is present as fallout from previous nuclear weapon explosions and other accidents/incidents world-wide.

Exposure of the UK population to man-made ionising radiation from medical and industrial activity is closely controlled and the estimation of all exposures, whether from natural or man-made radioactive sources, is undertaken by NRPB. These estimates show that, on average, doses from industrial activity plus weapons fallout are a very small part of the total (less than 1%), doses from medical practices are greater (about 14%) and the remainder (about 85%) comes from natural sources. Similar figures are seen in other developed countries.

The damaging effects of ionising radiation come from the packages of high energy that are released from radioactive material. Although different types of ionising radiation have different patterns of energy release and penetrating power there is no general property that makes man-made ionising radiation different and more damaging than the ionising radiation that comes from natural radioactive material. This means that we can make direct comparisons between doses from man-made sources of ionising radiation and those from natural sources.

Finally it is important to know that the radiations in the environment that come from sunlight, power-lines, electrical equipment and mobile phone systems do not have enough energy to produce these ionisations. Therefore, they are called non-ionising radiations.

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