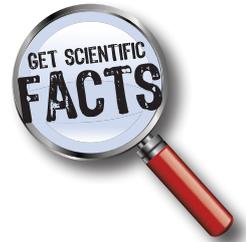




X-Ray Full-Body Scanners for Airport Security



To improve airport security in the light of terrorist threats new full-body scanners have been developed to complement existing metal detectors and hand searches.

Scanner types that do not use X-rays – “millimeter wave scanners” – are already allowed in the EU and deployed in some airports. Other types of scanners already used in the USA expose passengers to low levels of X-rays. They are not yet authorised in the EU because of concern about potential health risks. How safe are such X-ray security scanners for passengers, in particular for frequent flyers?

→ HOW DO THOSE FULL-BODY SCANNERS WORK?

Whole body scanners provide a picture of the person's body through the clothes to reveal hidden objects. Four technologies are currently on the market:

Millimeter-wave scanners, that don't use X-rays:

1. Passive scanners detect the very low levels of natural radiation emanating from the body surface.
2. Active scanners emit radio waves that are reflected back by the body surface.

X-ray scanners:

3. Backscatter scanners emit low energy X-rays that are reflected back by the body surface.
4. Transmission scanners send higher energy X-rays through the body in the same way as a traditional medical X-ray machine and can reveal objects inside the body.

→ HOW MUCH RADIATION ARE PEOPLE EXPOSED TO IN X-RAY SCANNERS?

When exposed to X-rays our body absorbs energy, the amount of energy effectively absorbed over time is expressed in “sievert” (Sv). Over the course of one year, a person should not be exposed to more than a total of 1 millisievert from man-made sources such as medical diagnostic devices or security scanners. This is the maximum acceptable limit set for the general public and is roughly equivalent to the amount of natural radiation we are also exposed to.

Transmission scanners that see into the body use higher energy X-rays than Backscatter scanner that only view the surface and as a result the dose absorbed is 10 times greater. A single scan is roughly the equivalent of one hour of background radiation at ground level, or 10 minutes at cruising altitude in an airplane. In the worst case scenario, of a person being scanned three times a day every working day throughout the year, a backscatter scanner would contribute 0,3 millisievert to their annual dose. A transmission scanner, however, would contribute 3 millisievert and exceed

the tolerable limit. In practice, most passengers would not be exposed so frequently to these scanners. This may however be a concern for airline crew or people who fly very frequently.

→ DOES EXPOSURE TO X-RAYS FROM SCANNERS PRESENT HEALTH RISKS?

Exposure to high levels of X-rays can increase the risk of cancer and cardiovascular diseases, lead to cloudiness of the lens of the eye and hereditary effects.

However, there is no evidence that the low radiation doses received from full-body scanners would induce any health problems. Nonetheless, each exposure adds to the overall radiation dose we receive in the course of our life and in the long term, the risk of developing cancer increases with radiation dose. While no dose can be considered completely safe, it is likely that the increased cancer risk from exposure to radiation from security scanners is so low that it cannot be distinguished from the effects of natural radiation or the background risk due to other factors. Direct evidence of an increased cancer risk has only been found for cumulative doses higher than 100 millisievert.

→ IS THE USE OF FULL-BODY X-RAY SCANNERS JUSTIFIED ?

To decide whether or not the use of X-ray scanners is acceptable, it is necessary to weigh the benefits and risks but this is not straightforward. The main benefit is improved flight safety but there are economic costs and low

health risks. So, whether or not X-ray scanners are acceptable for passenger screening is ultimately not a scientific, but a political decision that needs to take into account various factors.

This fact sheet is based on the scientific opinion “*Health effects of security scanners for passenger screening (based on X-ray technology)*” adopted on 26 April 2012 by the independent European Scientific Committee on Emerging and Newly Identified Health Risk.

The detailed and nuanced view of the European Scientific Committee on Consumer Safety on this issue is available at:

http://ec.europa.eu/health/scientific_committees/emerging/docs/scenih_r_o_036.pdf



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