A concept loses its way: Optimization vs Dose Constraints

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The History

ICRP INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

1977: ICRP 26
Justification – Optimization - Limitation

1990: ICRP 60
Justification – Optimization - Limitation,
but dose constraints and optimizing the number of persons

in between:
The Clarke-System: without limits, only dose constraints

2007: ICRP 103
Justification – Optimization - Limitation,
but a central function for dose constraints in optimization
(DC starting point for optimization, not the endpoint!)

The RP Community

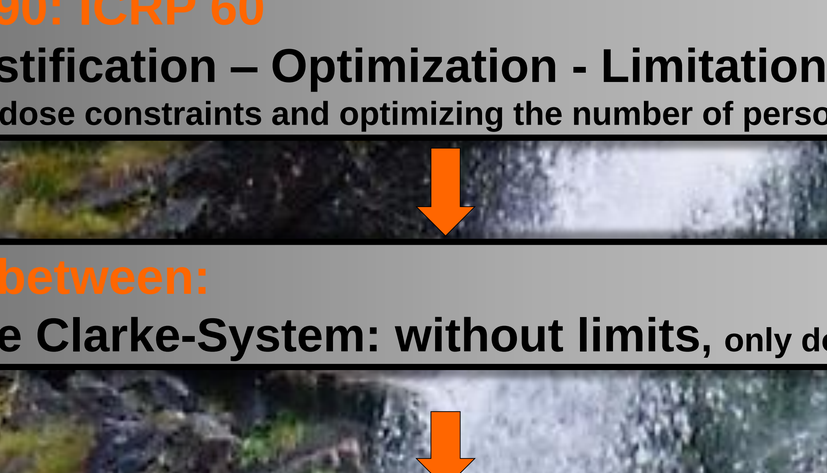
impressed

following

not following

following, but do they know the consequences?

The Reality



UNSCEAR 2008: the proof that the system works without DC: doses becoming smaller and smaller.

Source-related measures are used effectively, e.g. controlled areas or the encapsulation of a radioactive material or the safe design of a radiation device.
Source-related dose constraints may be useful as indicator for good practice.
Not every source needs a constraint (fire detectors or dental X-ray devices deliver tiny doses by design).

The European practice is that the DC concept is not implemented as it was intended. This reveals a NEA study.

Multiple sources can be controlled without DCs.
High individual doses can also be controlled without DCs.

ALARA is living because of the people and their ALARA thinking.

DCs will become limits in reality and will be questioned retrospectively. This is already an experience.

The Future?

Optimization needs no dose constraints at all.
The optimized dose is the result of the optimization.
And that's it.

We fear that radiation protection by fixation on numbers will become a bureaucracy instead of fostering the spirit of ALARA.

The slogan "each source a dose constraint" should be banned.

By the way: The Safety Fundamentals SF-1 (the "10 Command-mends of Safety and Protection") of the IAEA address optimization, but they do not name dose constraints and this is not by chance. Even ICRP 101 also describes optimization mainly without dose constraints.

Πάντα ῥεῖ
(*panta rhei*)
"everything flows"

Let's keep RP reasonable!