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# Key issues in developing updated guidance on exemption

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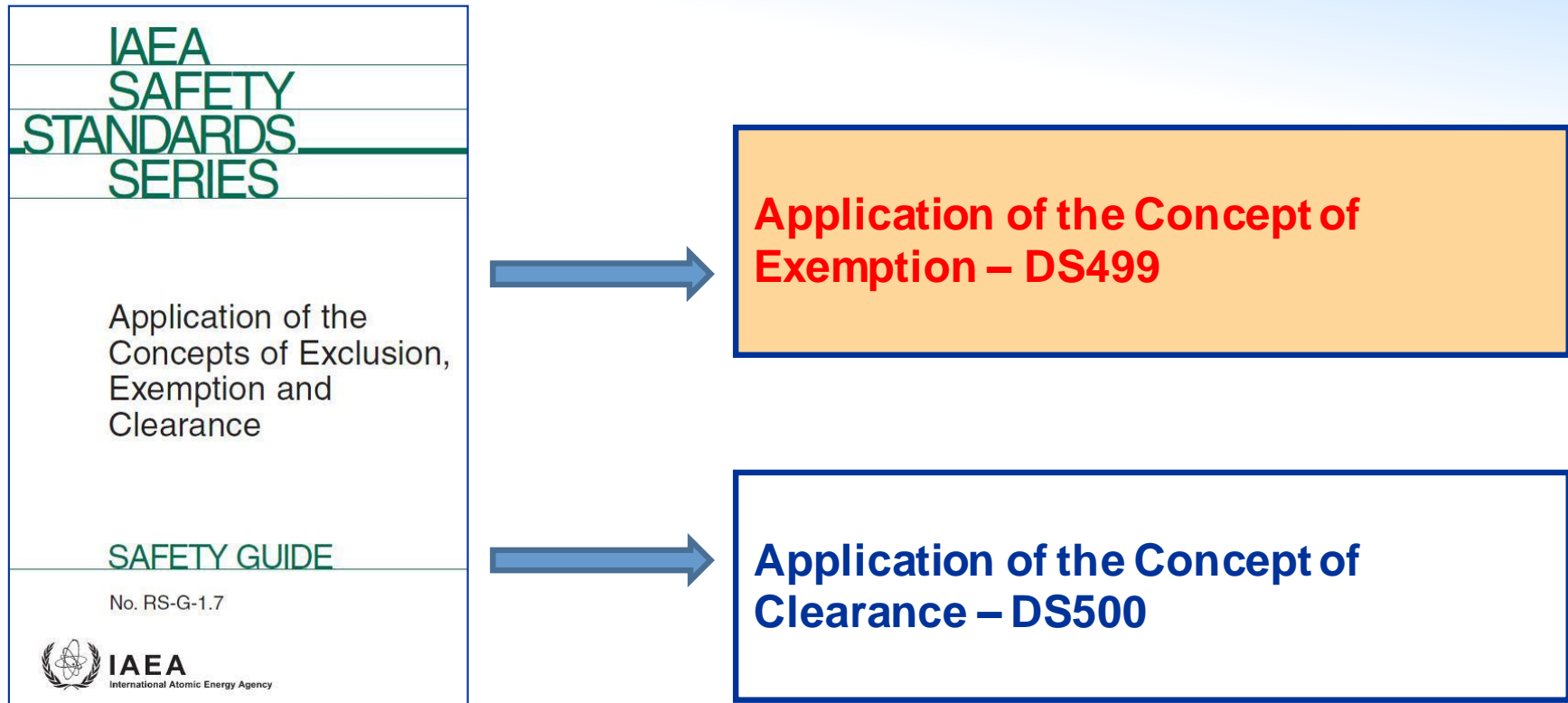
Radiation Safety and Monitoring Section

Division of Radiation, Transport and Waste Safety

# Content

- The concepts
- Revision of the guidance on exemption
- Key issues
  - What is trivial dose?
  - Planned exposure situations and dose limits
  - Existing exposure situations and reference levels
  - Moderate and bulk amounts of material
  - Consumer products
  - International trade of commodities
  - Artificial radionuclides
  - Radionuclides of natural origin
  - Surface contaminated items

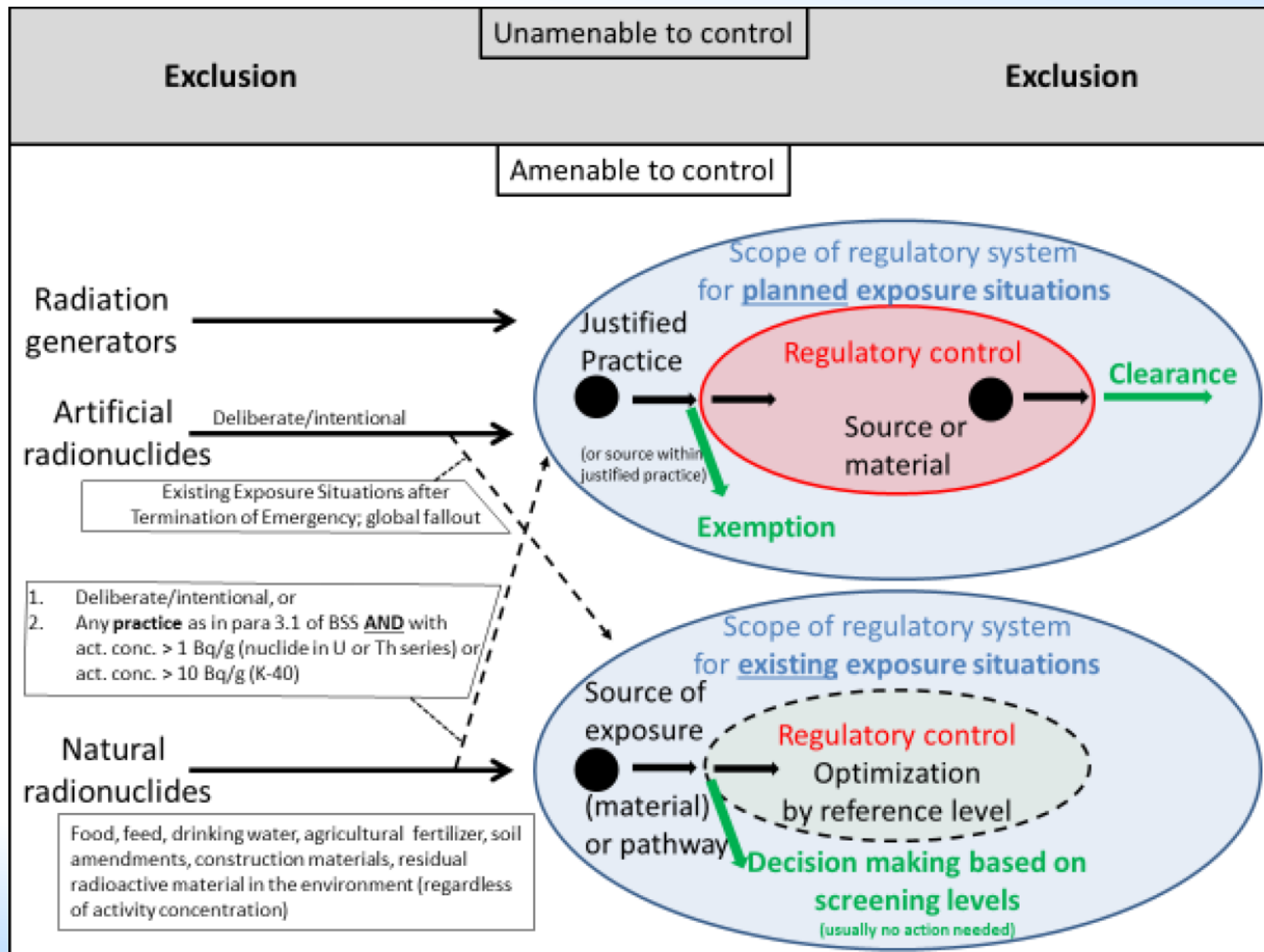
# Planned two new safety guides



A decision was taken by the Safety Standards Committee to revise the guidance on exemption and clearance published in 2004, the Safety Guide RS-G-1.7. It was decided to develop two new safety guides, one dealing with the application of the concept of exemption (DS499) and the other dealing with clearance (DS500). DPPs were endorsed by the CSS in 2017.

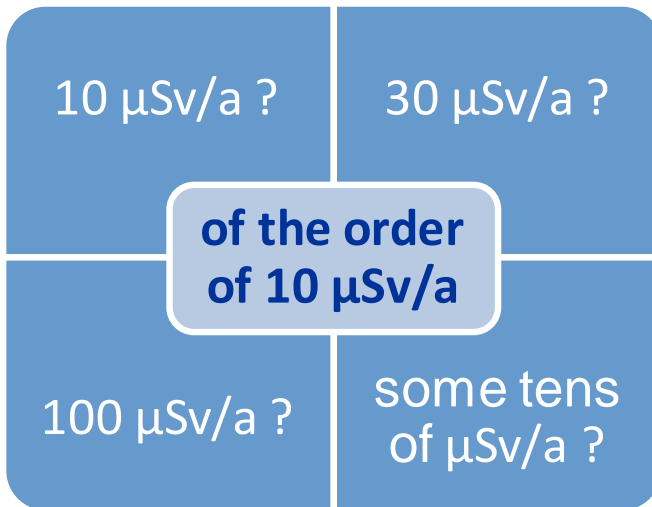
It was also agreed to develop an associated safety report to provide recommendations and technical aspects on international trade in commodities containing radionuclides.

# Already complicated....



# What is trivial dose?

- Under all reasonably foreseeable circumstances the effective dose expected to be incurred by any individual (normally evaluated on the basis of a safety assessment) owing to the exempt **practice** or the exempt **source within the practice** is of the order of **10  $\mu\text{Sv}$  or less in a year.**

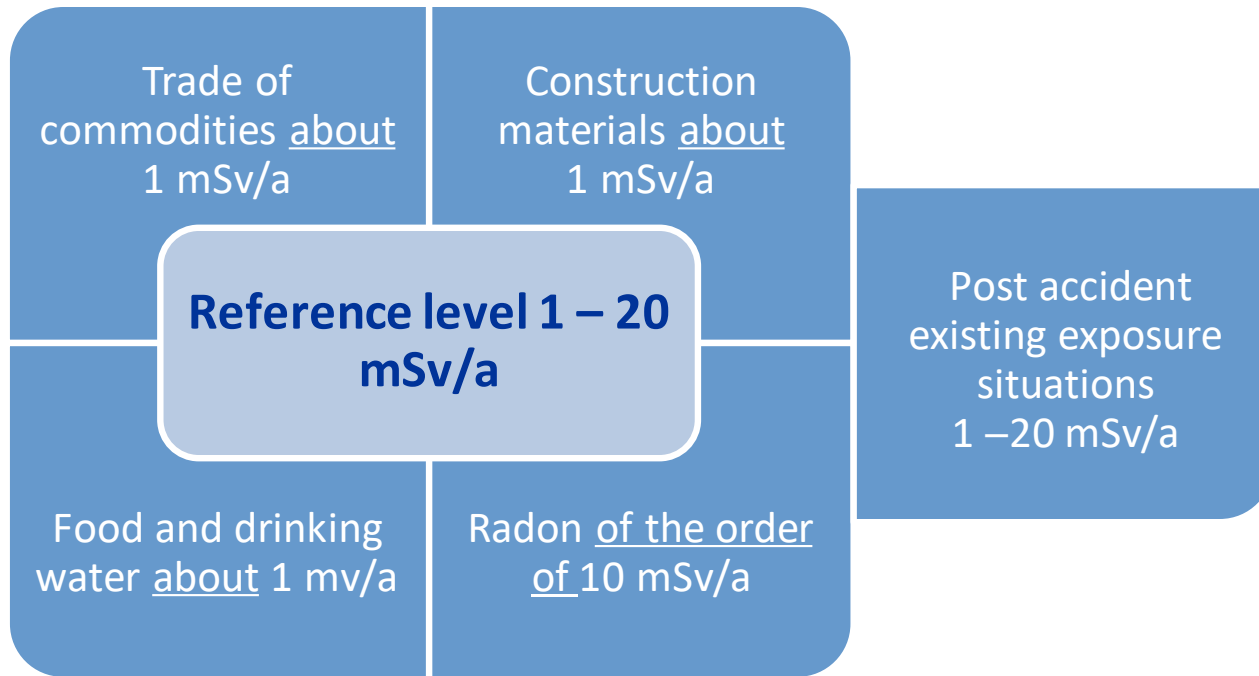


and

Low probability scenarios – 1 mSv/a

# ...and for existing exposure situations ?

## Optimisation using reference levels – subject to interpretations



What is the meaning of **does not exceed about** 1 mSv/a? = 2mSv/a or 3 mSv/a?

# Planned vs Existing exposure situations

- For exemption of a practice or source within a practice the criteria is specified in Schedule I of GSR Part 3.
  - Effective dose of the order of  $10 \mu\text{Sv/a}$
  - Low probability scenarios – does not exceed  $1 \text{ mSv/a}$
- How a similar approach can be considered in an existing exposure situation?
- Reference level in existing exposure situation ranges  $1 - 20 \text{ mSv/a}$
- How to deal with international trade ?

An approach using screening levels for decision making in existing exposure situations proposed in DS499.

# International trade



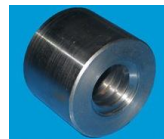
- Exposure due to commodities generally treated as existing exposure situations
- Radionuclides of natural origin, regardless of activity concentration, in commodities, including food, feed, drinking water, agricultural fertilizer and soil amendments, and construction materials, and residual radioactive material in the environment.
- How this can be translated into measurable quantities for trade exemption purposes against the GSR Part 3 requirement no.51?
- Instead of effective dose values, can we agree the values in Table I.1, I.2 and I.3 as a harmonized set of measurable concentrations or total activity to be used for trade purposes?



# Amount of material



- Moderate amounts – at the most of the order of a tonne
- How can we interpret this – 1t ? 3t? 10 t?
- What is bulk amounts?



# Consumer products



- Definition – deliberate incorporation of source in a device or manufactured item
- What are commodities?
- Does commodities include consumer products?
- Are food and drinking water consumer products or commodities?
- Do we need another term, for instance, Consumer goods?
- Understanding of public – weak and confusing

Safety guide available for [consumer products](#) – SSG-36

# Radionuclides

- 776 radionuclides listed in Table I.1 including U, Th series nuclides. [applicable for moderate amounts]
- 257 radionuclides listed in Table I.2 [applicable for bulk amounts]
- No values for natural uranium, thorium etc in Table I.2 (case by case analysis required)
- What about radionuclides not listed in these tables?
- Can we use this table values in post-accident existing exposure situations?

# Radionuclides of natural origin

- What about bulk material containing radionuclides of natural origin? Below and above 1 Bq/g of U or Th series nuclides
  - Below 1 Bq/g – Existing exposure situations
  - Above 1 Bq/g – Planned exposure situations
- GSR Part 3 Table I.3 values (1 Bq/g for U or Th series nuclides and 10 Bq/g for K-40) specified for clearance. **It is not specified for exemption?**
- Cleared material as such do not enter regulatory regime again. In turn these values becomes criteria for exemption? **But below 1 Bq/g is treated as existing exposure situations and optimisation using reference level is the requirement!**

# Surface contaminated items



- How to manage surface contaminated items for exemption purposes?
- Several dosimetric models available.
- How these models can be used by the regulators or the applicant to evaluate possible exposures and to verify compliance with exemption criteria? (expert assistance required and time consuming)
- Can we apply the transport values for exemption purposes?

DS499 provides some guidance

# Summary

- Application of the concept of exemption is not straight forward.
- Planned vs existing exposure situations make system of radiological protection complex.
- How to address exemption issues in Existing Exposure Situations?
- Confusing definition of consumer products.
- Exemption of a practice or source within a practice involving radionuclides of natural origin becomes subjective in nature and interpretable.
- International trade of commodities is under existing exposure situation and need harmonization in the approaches.
- New guidance necessary for exemption of surface contaminated items.



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Thank you!

