

European ALARA Network

APPLICATION OF THE GRADED APPROACH FOR THE RADIATION PROTECTION OF WORKERS AT THE WORKPLACE

EXAMPLES AND REFLECTIONS FROM TWO EUROPEAN ALARA NETWORKS

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“The graded approach”

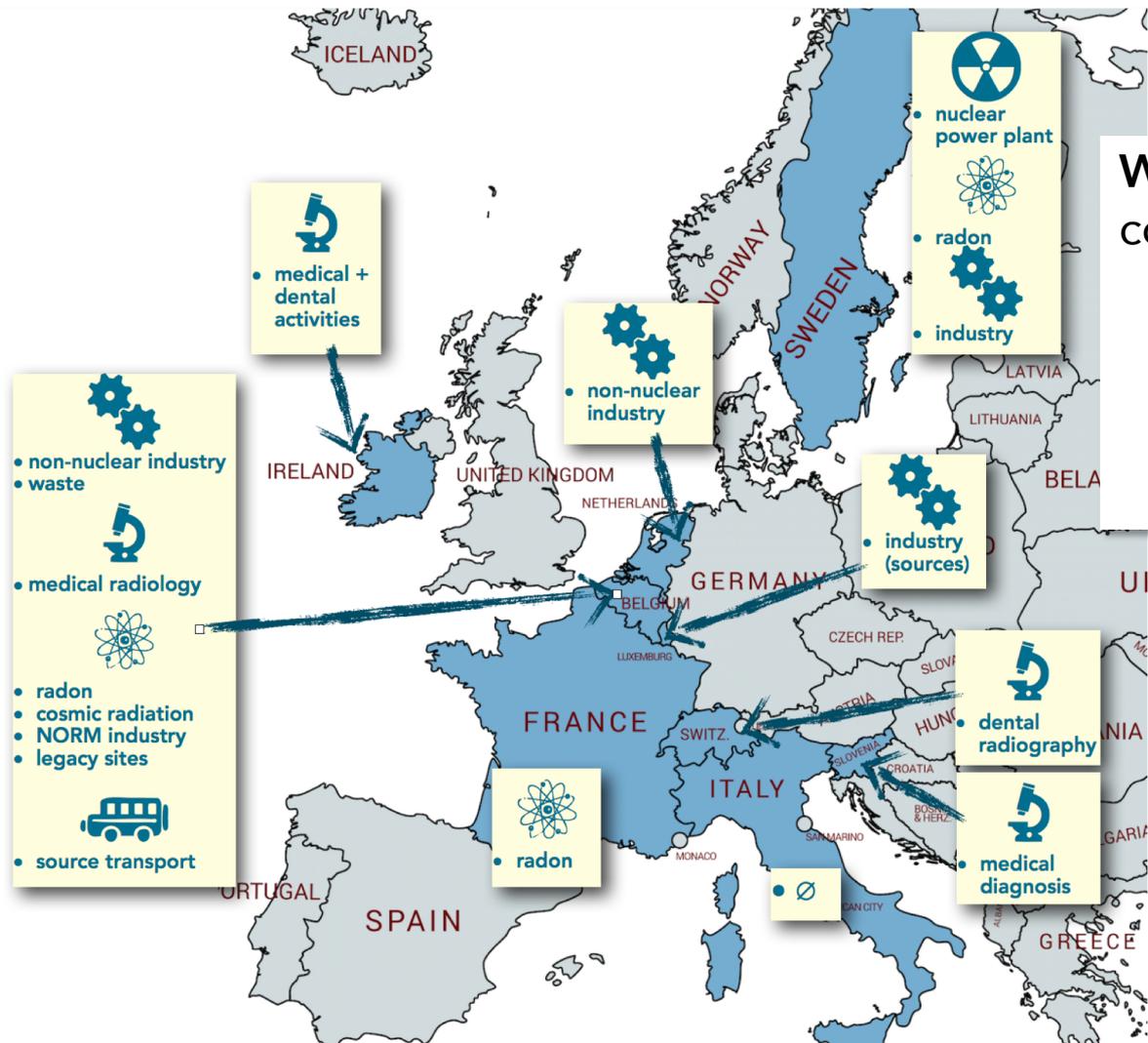
- (36) Member States should benefit from the application of a **graded approach** to regulatory control, which should be commensurate with the magnitude and likelihood of exposures resulting from the practices, and commensurate with the impact that regulatory control may have in reducing such exposures or improving the safety of installations.

Euratom Council Directive 2013/59, OJEU, 5 December 2013.

Appeared also in ICRP
Publications 122, 126,
132 and 142

**What about the
interpretation of (36) and its
implementation in practice?**

Coverage of the brainstorming and survey



Wide application and large coverage

- N = 20 examples
- From 10 countries
- Different exposure situations ("*practices*")

Some examples

Ex. 1 – Grading of medical imaging practices, Switzerland

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Dose to patient < 1 mSv • Dose to patient [1—5] mSv • Dose to patient > 5 mSv | → | <ul style="list-style-type: none"> • License procedures, the documents, requirements needed to apply for a license as well as the RP requirement follow the graded approach |
|---|---|--|

Ex. 2 – Grading of dental radiology, Slovenia

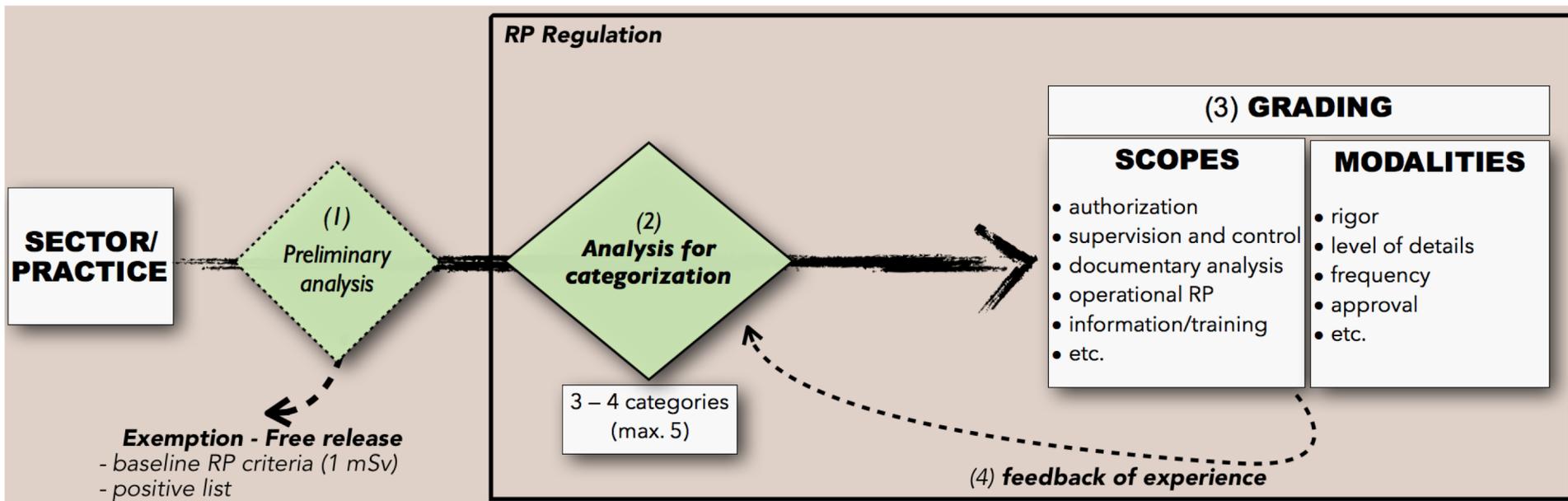
- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Installation with cone beam CT • Installation with intraoral/panoramic dental imaging | → | <ul style="list-style-type: none"> • Full scope of RP requirements • Limited scope of RP requirements |
|--|---|---|

Ex. 3 – Transport of radioactive packages, Belgium

- | | | |
|---|---|--|
| <p>Decision-making process with 11 criteria (most non-radiological)</p> | → | <p>The score determines the number of inspections per year: 5 frequencies possible</p> |
|---|---|--|

⇒ **Wide interpretation:** large variety of “graded approaches”

Proposal for a generic scheme for a graded approach



Discussion on the decision process

- **(1) Preliminary analysis**
 - Focus on the 1 mSv/year = “magic value” for exemption
 - *“People tend to ask why there is both a reference level and a limit value”**
- **(2) Categorization**
- **Radiological criteria** (ex. mSv, mSv/y, man.mSv, Bq.g⁻¹, Bq.m⁻³, (Bq.h.m⁻³).y⁻¹, etc.)
 - Ascertaining between data from measurement vs. prognosis/derived
- **But not the only consideration**
 - Ex. type of technologies, of operation (ex. *medical, non-nuclear industries*)
 - High-level criteria: risk assessment, documentary analysis, international recommendation
- From 1 criterion to ... many (11 criteria)
- **How is the control graded?** (decision by the Authority)
 - *“sound expert judgement”, “may be helped by rules of the thumb”, decision-aiding techniques, scoring matrix*
 - Non-radiological consideration may be dominant (ex. *NORM waste, legacy sites*) and may supersede radiological criteria (ex. *pregnancy*)
 - **Elements for an holistic approach?**

* Text in *“italic”* are direct quotes from the survey

Discussion on optimization

- **The highest regulatory effort is allocated to the sectors/installations with the higher risk, the effort is commensurate for the others**
 - Particularly relevant for some sectors: panoply of installations and/or wide distribution of exposure
- **Release of regulatory constraints** (ex. from 1740 → 400 medical installations under authorization, Ireland)
 - *“Due to limited scope of RP measures, cost for the practice is reduced and authorisation process is simplified”*
 - Release from RP regulation possible
 - Illustrate different cultural/national approaches
 - *« a big shift »* for some Authorities
 - How to ensure the consistency of the graded approach (comparable risk = comparable requirements)?
 - Is it necessarily going toward an optimization of the radiation protection?
- **New entrants in regulation**
 - *“there is a vast amount of workplaces that have to be reached and motivated”*

Discussion on communication and 'stakeholder involvement'

- **Early involvement of the professionals** in the process is *"vital part to obtain cooperation and operability of the new regulation"*
- And gain elements from the field about where/how put the grading
- How?
 - Classic: Communication strategy, consultation, working groups
 - Other tools: Opening new channel of communication (dedicated website), peer-review, co-construction of guidelines
- This also makes the process more transparent and in favour of RP culture
- If not ...
 - *"Regulators and operators are unclear about the requirements, this has resulted in [the regulation] becoming overly burdensome with no corresponding improvement on radiation safety"*

How does this matter for ICRP?

- Definitions are important:
 - *"Clear definitions" needed, "definitions have to be thorough to avoid gap and confusion"*
- Communication, practicability and transparency are vital (= ICRP procedural values in practice)
- A tendency for the users to meet the exemption level
 - With a focus on "magic value"
- The issues in the release of RP requirements and the new entrants in RP
 - How to be consistent? And optimized?
- Is a graded approach necessary for some specific sectors (medical)?
- Provide methodological elements about how/where to proportionate the graded approaches, based on the circumstances (holistic approach?)

Synthesis

- Wide application and interpretation of the graded approach (with limited adherence to the theory in the Directive)
 - Present a plausible basis for the graded approach + reflections on hot topics for ICRP
 - One tool to achieve reasonableness in radiation protection in a proportionate manner
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- Gradation mainly applied to the radiation protection requirements
 - However, the *“graded approach may take advantage of the control mechanisms already existing/defined in other regulations”*
 - Conversely, can the management of other risks be of inspiration?
 - Aiming for a **graded** (eventually holistic) **and integrated approach?**



- Synthesis of the brainstorming, www.eu-alara.net, March 2019
- Synthesis of the EAN and ERPAN Brainstorming meeting and survey, EAN Newsletter **45**, April 2021



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**Interested by the activities?
To get involved in the networks?
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