Revision and consolidation of Euratom Basic Safety Standards

NORM-industries
Building materials

European Commission
DG Energy
D4: Radiation Protection
Augustin Janssens

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Revision and consolidation BSS DIRECTIVE

- Article 31 Group of Experts since 2005
- Topical issues
  - natural radiation sources
  - exemption, clearance, graded approach
- WP “Recast”
  - First consolidated draft text: meeting in June 2009
  - Final text for Article 31 Experts in November 2009
- Approval of draft text and related Opinion
  - on 23-24.2. 2010
- Impact Assessment Report
- Inter-Service consultation
- Translation
- Commission proposal adopted on 29 September 2011

http://ec.europa.eu/energy/nuclear/radiation_protection/doc/art31/2010_02_24_draft_euratom_basic_safety_standards_directive.pdf
http://ec.europa.eu/energy/nuclear/radiation_protection/doc/art31/2010_02_24_opinion_on_bss.pdf

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RECAST
Better legislation - simplification

- Directives:
  - Basic Safety Standards (workers, general public): 1996
  - Patients/Medical Directive: 1997
  - Informing the public on measures in the event of a radiological emergency: 1989
  - Outside Workers: 1990
  - High Activity Sealed Sources (HASS): 2003
  - (Radon Recommendation 90/143/Euratom)
- Recast:
  - In principle no discussion of unmodified text
  - In practice: too many changes with cross-cutting impact
  - Hence: "**consolidation**"

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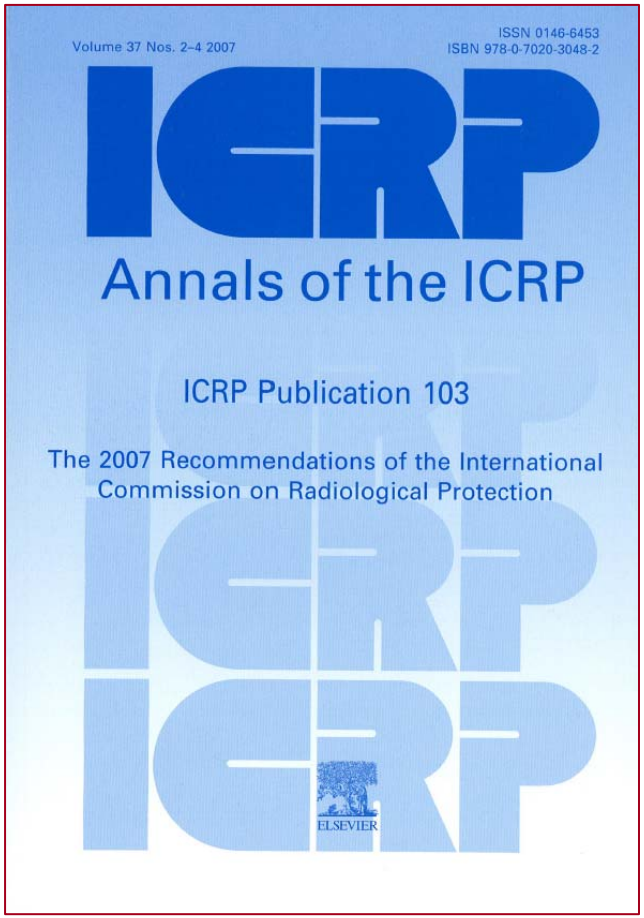
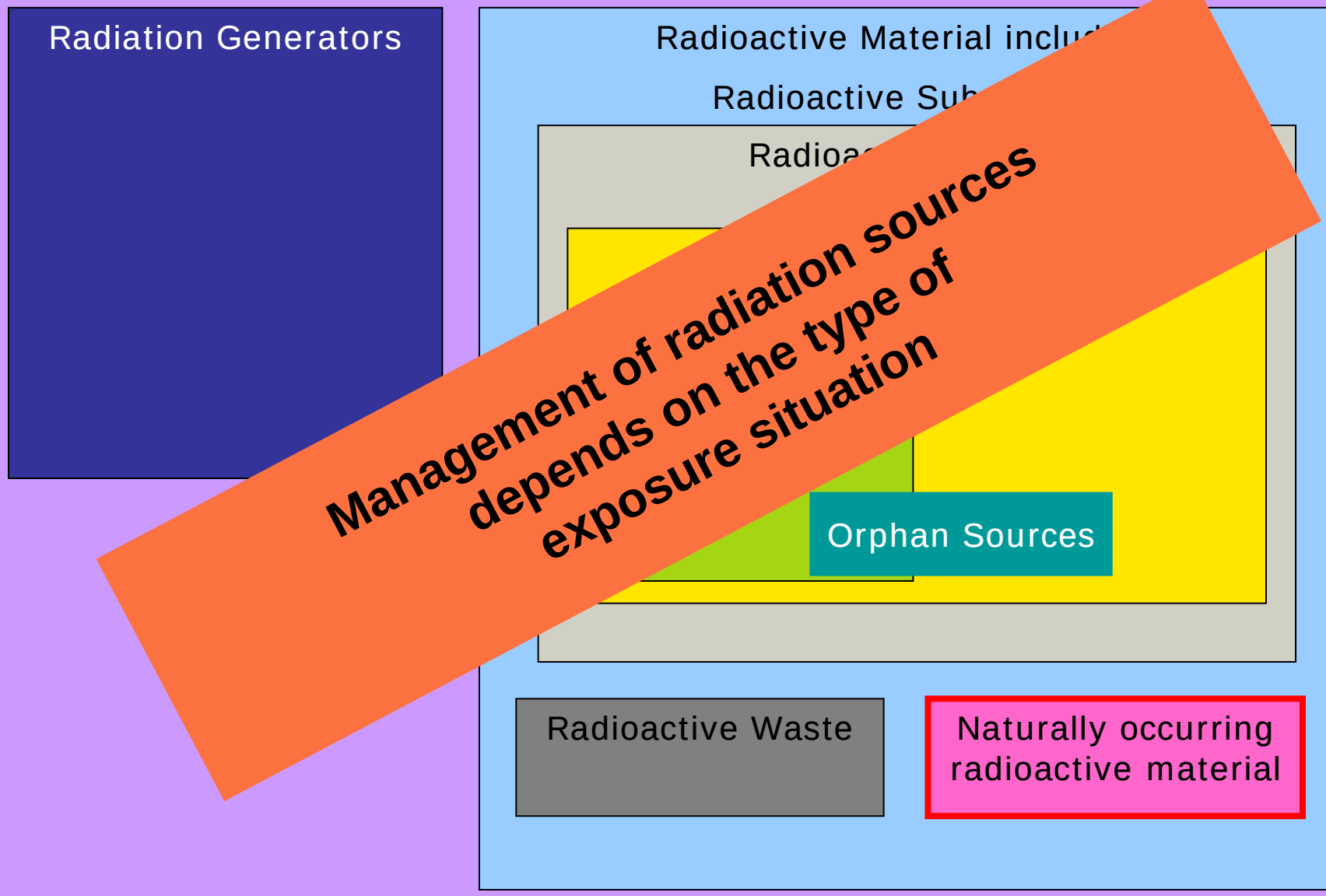
Revision of EU-BSS

- Consolidation of current Directives
- Allow for ICRP/IAEA
  - Exposure situations
    - rather than processes: practices/interventions
  - Incorporate natural radiation sources
    - strengthen the requirements



Radiation Sources



Exposure situations
Euratom approach

- Planned: new source or new pathway of exposure resulting from the activity
  - industries processing naturally occurring radioactive materials (NORM)
  - operation of aircraft
- Existing: resulting from features of the location (not the type of activity)
  - indoor Radon (ingress from soil)
  - commodities managed together with the exposure situation:
    - building materials (gamma exposure, radon exhalation)
    - foodstuffs (post-accidental situation)
- Emergency: urgent situation, which can be planned or prepared for

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Options for structure:

PLANNED EXPOSURE SITUATIONS	EMERGENCY EXPOSURE SITUATIONS	EXISTING EXPOSURE SITUATIONS
Occupational exposure	Occupational exposure	Occupational exposure
Public exposure	Public exposure	Public exposure
Medical exposure		

OCCUPATIONAL EXPOSURE	PUBLIC EXPOSURE	MEDICAL EXPOSURE
Planned exposure situations	Planned exposure situations	Planned exposure situations
Emergency exposure situations	Emergency exposure situations	
Existing exposure situations	Existing exposure situations	

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Table of contents of revised EU-BSS

Preamble

Chapter I	Subject Matter and Scope
Chapter II	Definitions
Chapter III	System of Protection
Chapter IV	Requirements for Education, Training and Information
Chapter V	Justification and Regulatory Control of practices
Chapter VI	Protection of Workers, Apprentices and Students
Chapter VII	Protection of Patients and other Individuals submitted to Medical Exposure
Chapter VIII	Protection of Members of the Public
Chapter IX	Protection of the Environment
Chapter X	Requirements for Regulatory Control
Chapter XI	Final provisions

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Reference levels

- Bands of reference levels for public exposure and corresponding societal criteria
- RL in the range 20 mSv – 100 mSv for *emergency* exposure situations
  - below 20 mSv if no disproportionate detriment or excessive cost of countermeasures
- RL in the range 1 to 20 mSv per year for *existing* exposure situations
  - indoor radon exposure
  - long-term post-accidental management
- RL below 1 mSv for specific pathways of exposure

Planned exposure situations

- NORM industries
- Aircrew
  - Same as in Directive 96/29Euratom
- Space-crew
  - Specially authorised occupational exposures

List of industrial practices (including secondary processes)

1. Extraction of rare earths
2. Production of thorium compounds
3. Niobium/tantalum ore
4. Oil and gas
5. Geothermal energy
6. TiO_2 pigment production
7. Zircon and zirconium industry
8. Thermal phosphorous production
9. Production of phosphate fertilizers
10. Cement production
11. Maintenance of boilers of coal-fired power plants
12. Phosphoric acid production
13. Tin/lead/copper smelting
14. Ground water filtration
15. Mining

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Justification and regulatory control of planned exposure situations

Graded approach

- Proportionality
- Effectiveness of regulatory control

Member States shall require any notified practice to be subject to regulatory control commensurate with the magnitude and likelihood of exposures resulting from the practice,

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Justification and regulatory control of planned exposure situations

Graded approach

- Proportionality
- Effectiveness of regulatory control

Member States shall require any notified practice to be subject to regulatory control commensurate with the magnitude and likelihood of exposures resulting from the practice,

and commensurate with the extent by which regulatory control may have an impact on reducing such exposures or improving the safety of the installations

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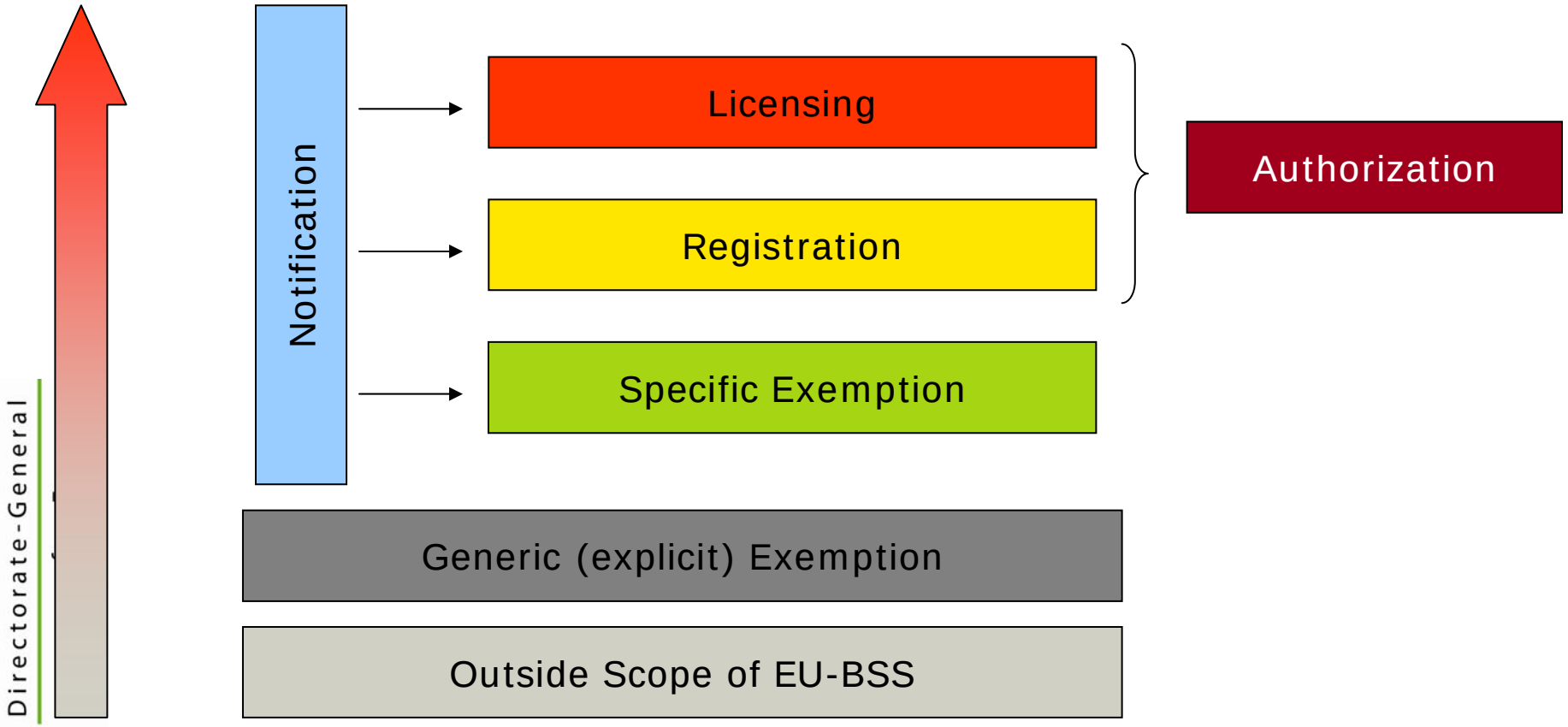
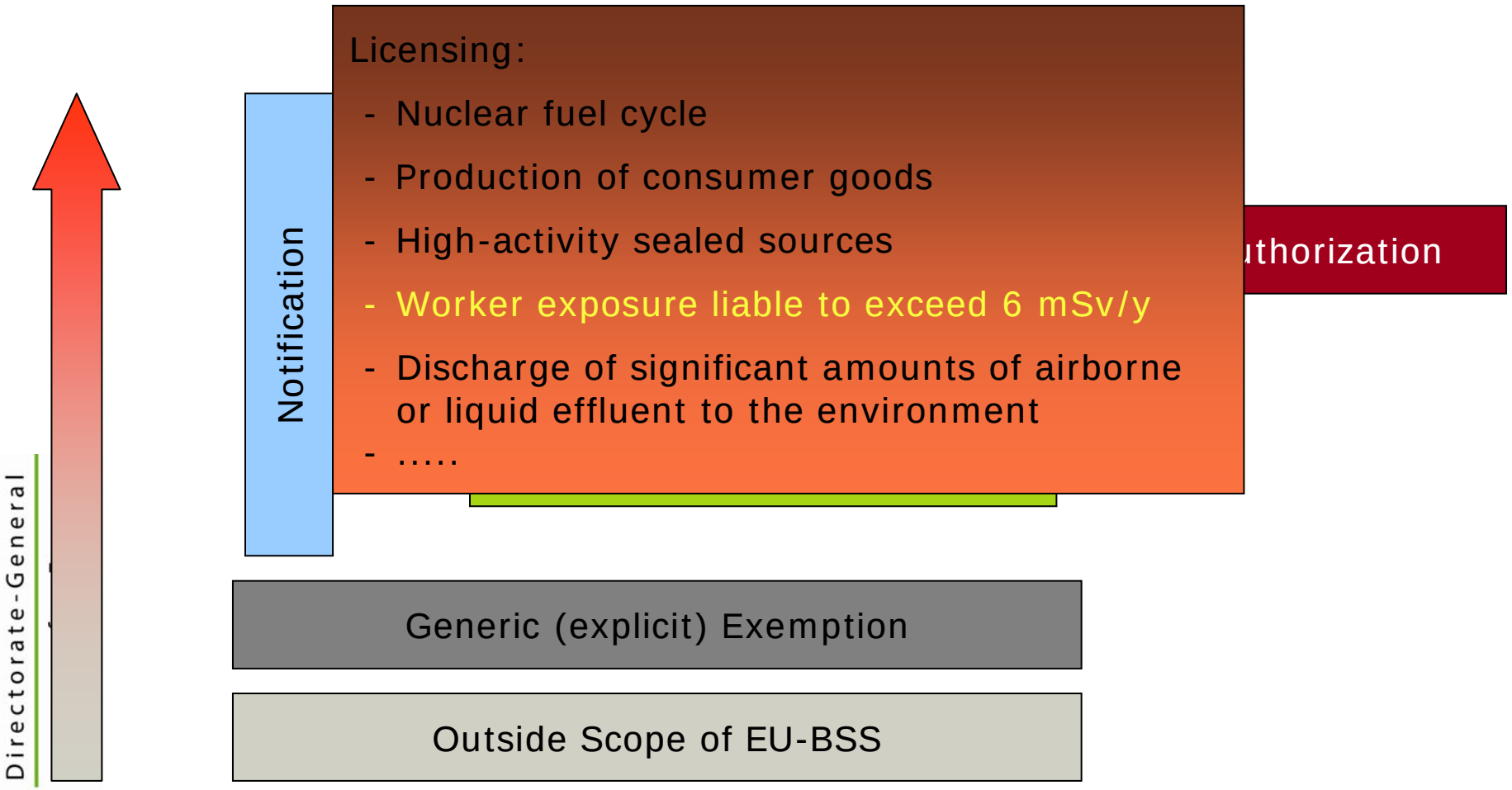
Regulatory Control - Graded Approach



Regulatory Control - Graded Approach



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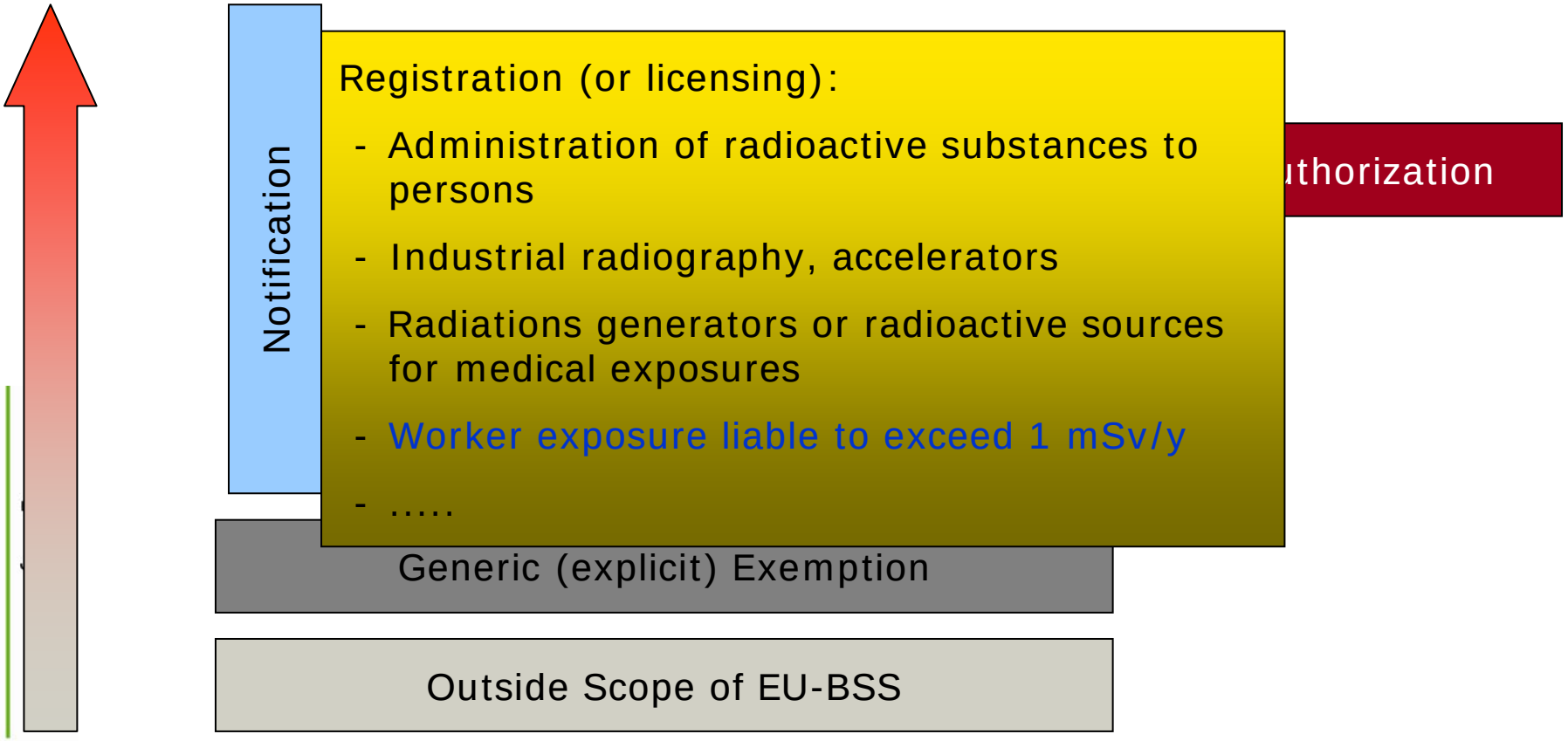

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Arrangements in Workplaces Article 33.2

- For practices involving **naturally occurring radioactive material** where the effective dose to workers is liable to exceed **6 mSv** per year, the requirements set out in this Chapter shall apply
- Where the effective dose to workers is less than or equal to **6 mSv** per year the competent authorities shall at least require undertakings to keep exposures under review, taking into account
  - the potential for protection to be improved, or
  - for doses to increase over time or as a result of changes in the process or the work arrangements

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Existing exposure situations

- Radon (workplace, dwellings)
- Building materials

New BSS: Radon action plan

- *”Member States shall establish an action plan to manage long term risks from radon exposures in dwellings, buildings with public access and workplaces for any source of radon ingress, whether from soil, building materials and water.”*
  - Take into account issues specified in Annex XVI

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Radon Action Plan
indicative list of issues in Annex XVI

- Assign responsibilities, allocate resources for measurements and remedial actions
- Criteria for delineation of radon prone areas
- Criteria for identification of buildings of concern
- Criteria for accreditation of measurement and remediation services
- Strategy for increasing public awareness in relation to smoking
- Long term goals for reducing lung cancer

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Chapter VI Protection of workers
Radon in workplaces

- Establishment of national reference level,
  - not exceeding 1000 Bq/m^3
- Measurements necessary in
  - workplaces located at ground floor or at basement level in radon prone areas
  - specific types of workplaces identified in action plan
- Principle of optimisation
  - Reduce radon concentrations or exposures
- If levels stay above reference level despite actions
  - Manage as a planned exposure situation
  - Dose limit and requirements for occupational exposure apply

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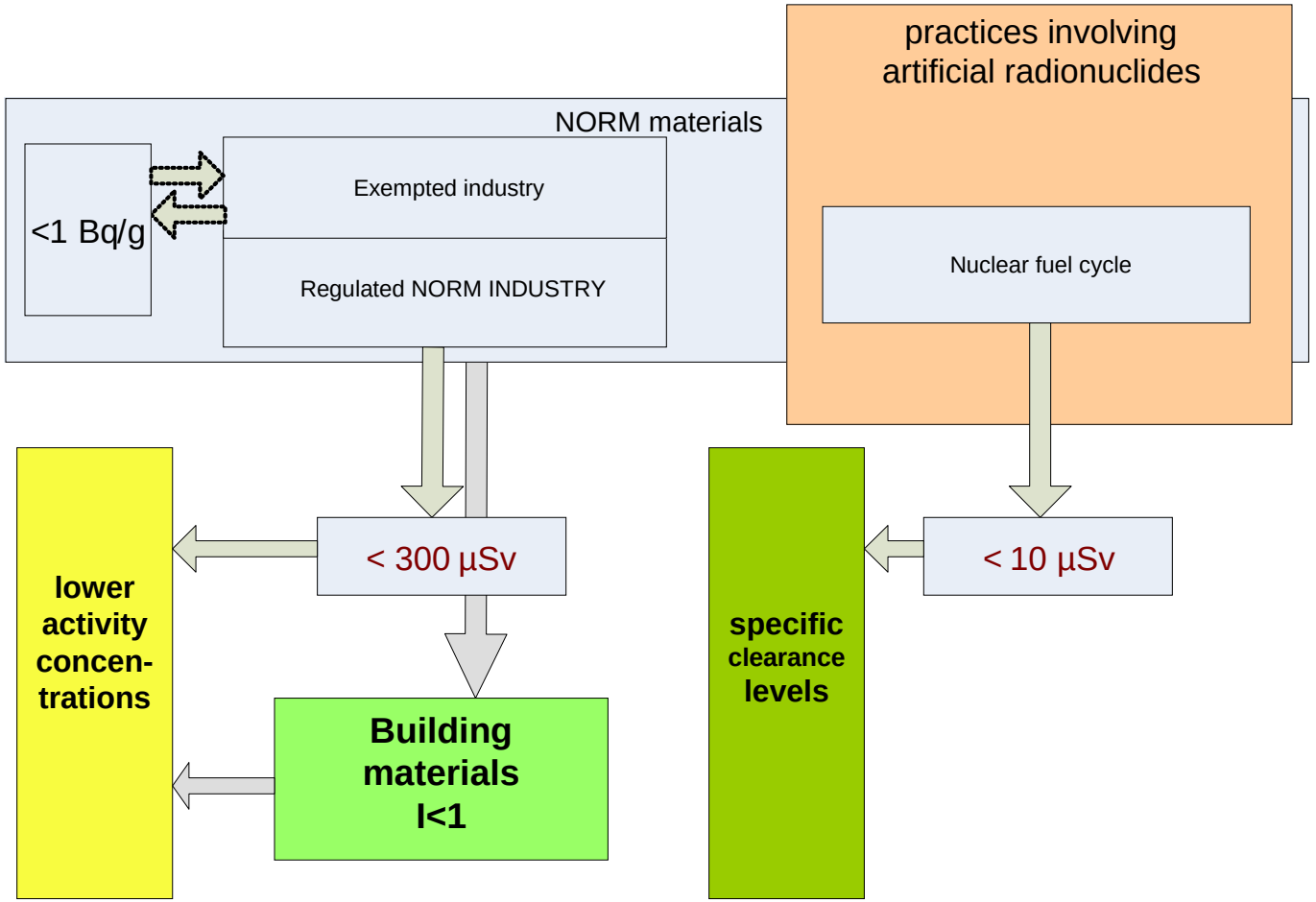
Building materials

- Reference level of 1 mSv per year
  - for indoor external exposure from building materials
    - in excess of the background outdoor external exposure
- Below 1 mSv/y the material is exempted and free on the market in EU
  - above 1 mSv/y the national authority may consider appropriate control measures
- Information about the materials relevant for compliance with building codes should be available before their placing on the market
  - activity concentration index
  - two categories (reflecting whether the material is used in bulk or superficial quantities)
  - CEN/TC standards (construction products)

NORM residues
Clearance criteria



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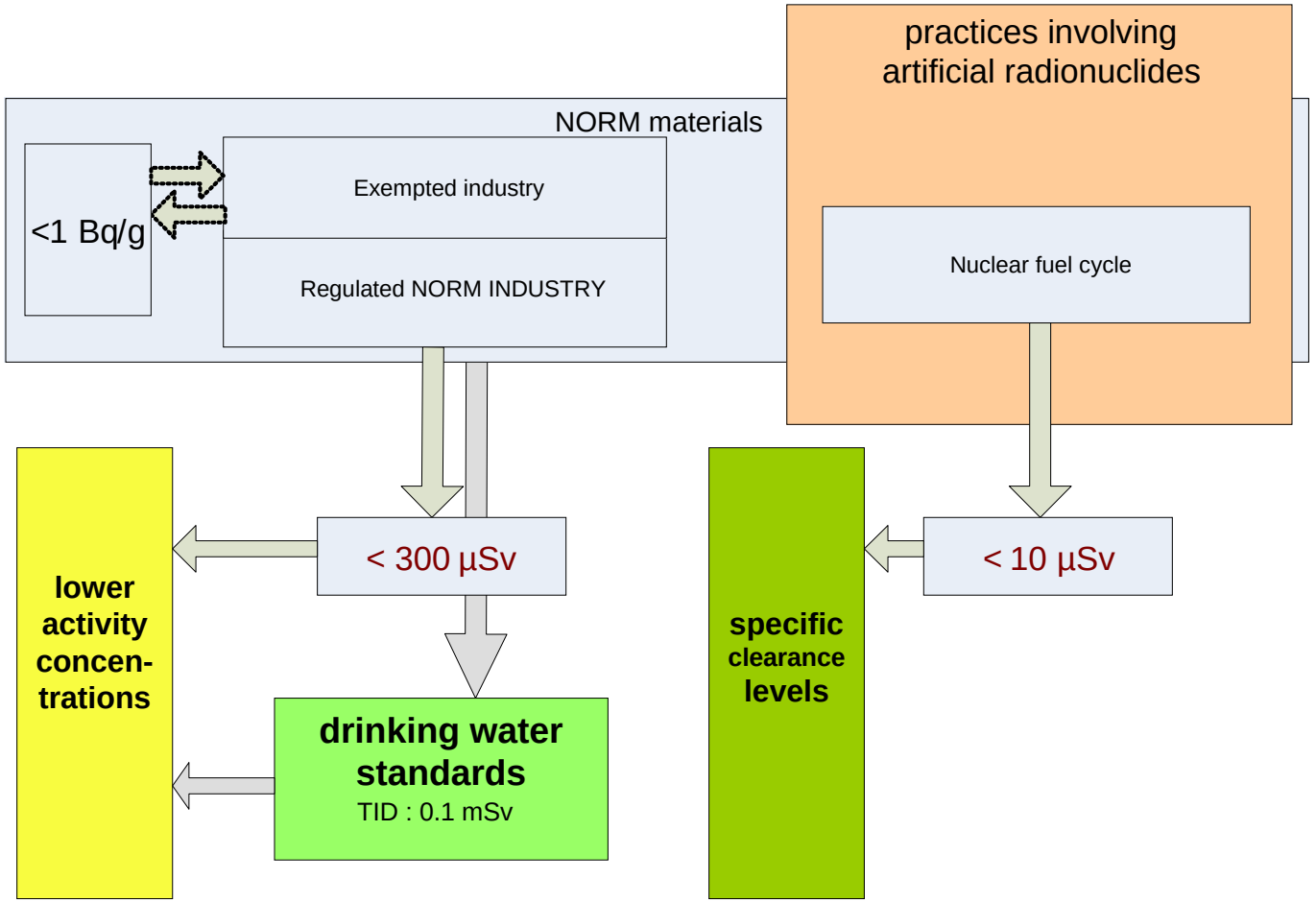
NORM residues
Clearance criteria



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List of types of building materials

- Natural materials
- Materials incorporating residues from NORM industries
  - Fly ash
  - Phosphogypsum
  - Phosphorus slag
  - Tin slag
  - Copper slag
  - Red mud (Aluminium production)
  - Residues from steel production

Conclusions

- NORM industries now a regulated practice
- Graded approach to regulatory control
- Flexible approach to occupational exposure
- Management of residues
  - Effluents
  - Waste (water contamination)
  - Recycling (building materials)
- Need for feed-back from regulatory experience

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