

# Standards for NORM-industrial practices in the EU-BSS graded approach – elaboration of a strategy for Austria

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# Introduction

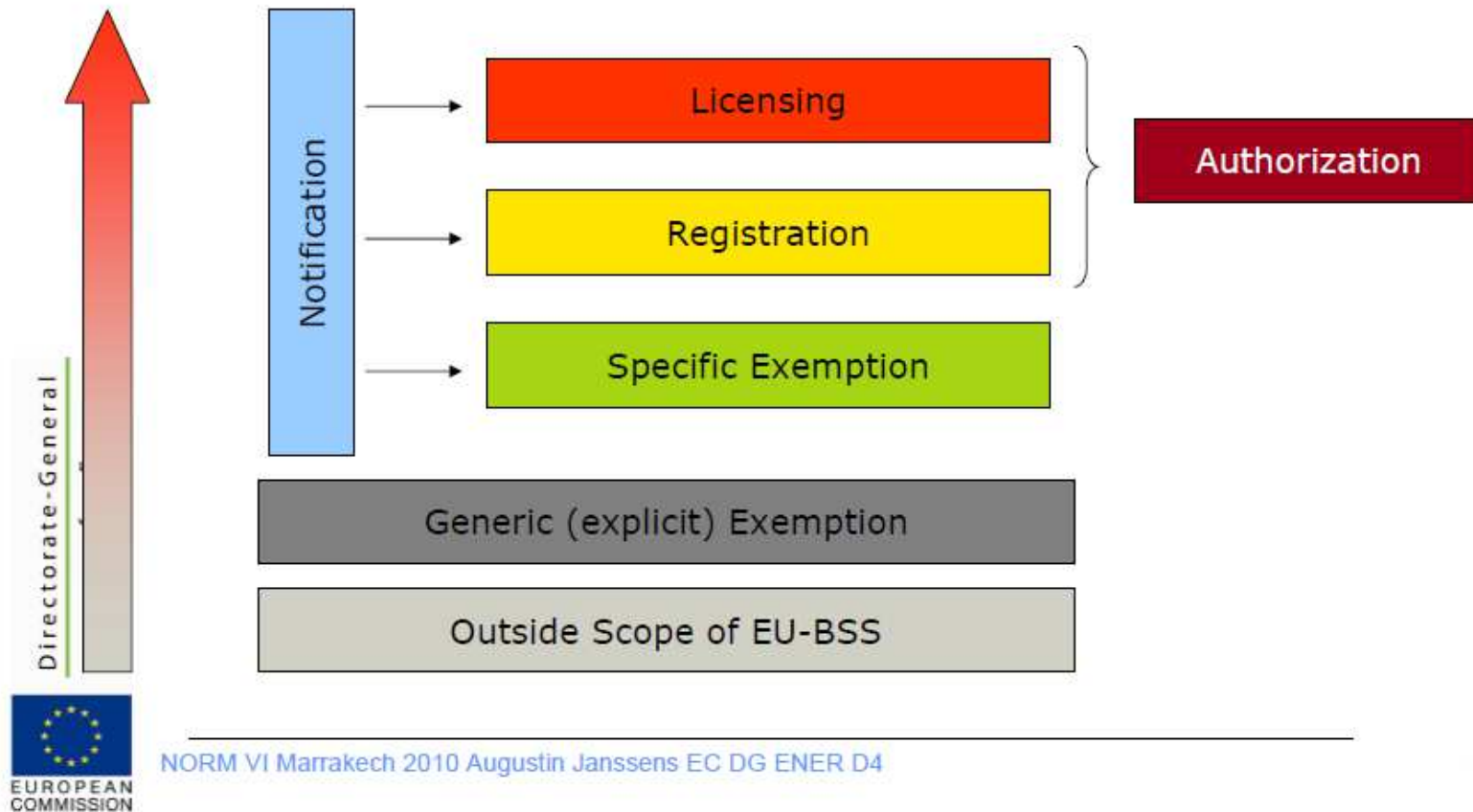


**The new Directive 2013/59/EURATOM (EU-BSS) implies a harmonization of the regulation of natural radionuclides with the regulation of artificial radionuclides.**

**The Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management in scope of EU-BSS implementation in cooperation with others the leading competent authority for implementation of the EU-BSS in Austria.**

**In this context, the Austrian Agency for Health and Food Safety (AGES) acts as technical support organization.**

# Graded approach in the EU-BSS:



NORM VI Marrakech 2010 Augustin Janssens EC DG ENER D4

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From: Janssens and Wiklund, 2010

## Exemptions in the graded approach (EU-BSS):



Both kinds of exemptions may be established.

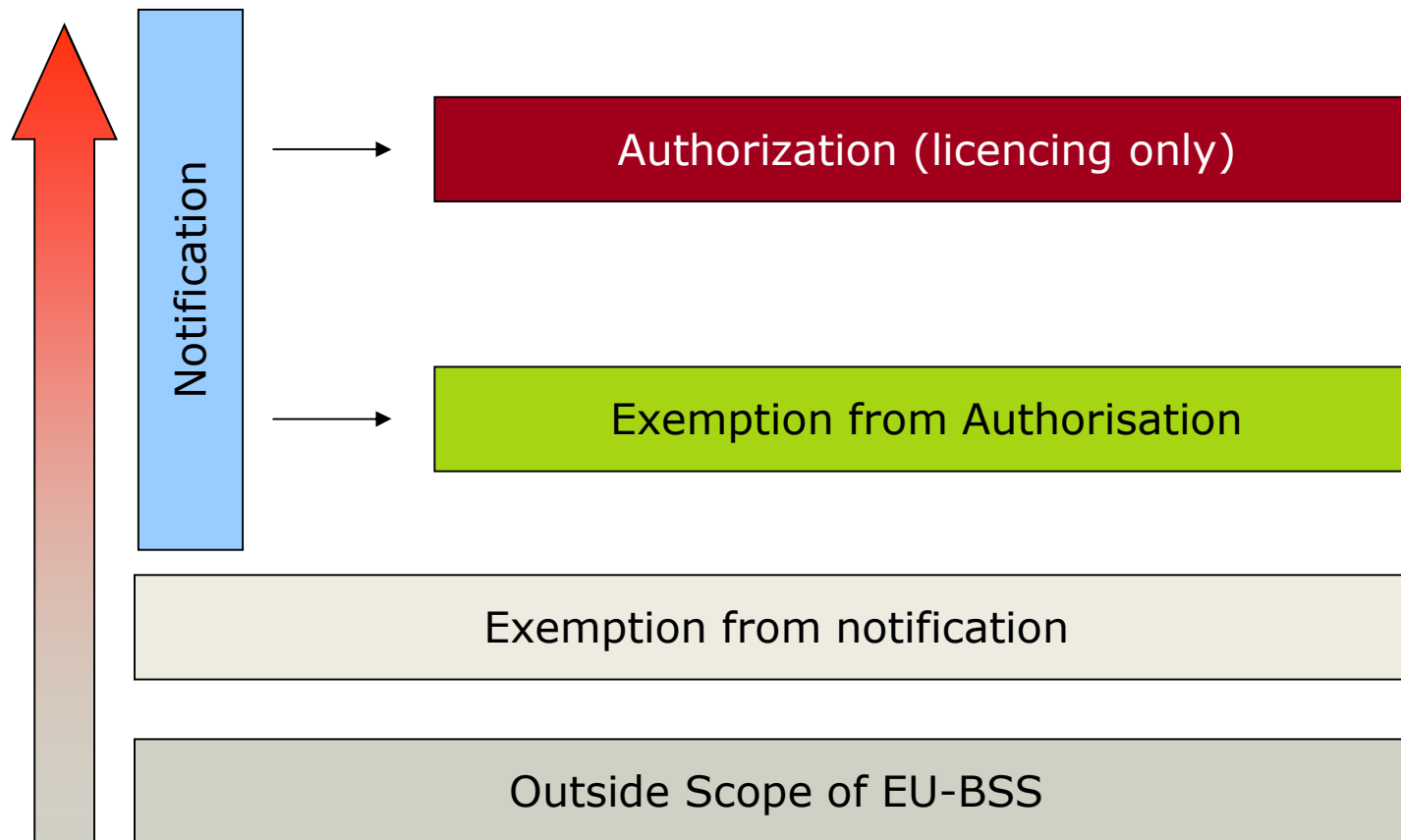
- A) Exemption from notification (Art. 26)**
- B) Exemption from authorization (Art. 24 (2))**
- + ) Criteria for the exemption of practices from notification and authorisation are laid down in Annex VII of the EU-BSS.**

# Current regulation in Austria and gap analysis:



- Notification only
- No license for NORM
- A graded approach will have to be established.
- Main issues for implementation:
  - Establishment of a graded approach for natural and artificial radioactivity
  - Clarification of the scope of the regulation (positive list)
  - Clearance criteria will have to be alternated
  - Radon
  - RPO/RPE

# Intended regulation for Austria:



# The intended regulation for Austria (cont.):



- Criteria for graduation within the regulatory control will be defined in an ordinance.
- They must comprise workplaces, residues and discharges.
- Intended criteria:
  - Activity concentrations are below the values in Table A, part 2 in Annex VII of the EU-BSS for exemption from notification.
  - Activity concentrations exceed the values in Table A, part 2 in Annex VII of the EU-BSS, but the effective dose is below 1 mSv/a for exemption from authorization
  - Licencing: Whenever above 1 mSv/a and the practices listed in Art. 28 of the EU-BSS.



# Dose assessment



- Dose assessment is the basis for the decision of the responsible authority for the appropriate level in the graded approach.
- A concept for guidelines and standards for a standardised assessment will be necessary to clarify if an activity concentration the values in Table A, part 2 in Annex VII of the EU-BSS or an exposure of 1 mSv/a is exceeded.

 The Austrian Standards for the dose assessment (workplaces and public exposure) will have to be adjusted with this respect.

# Identification of practises



- Scope of the regulation:
  - An Austrian positive list of industrial sectors will have to be defined (currently in progress)
- Collection of information about:
  - the relevant materials involved
  - their expected activity concentration
  - their maximum activity concentration
  - expected contamination scenarios according to the practices
  - disposal, recycling or reuse

# Clarification of the scope of the regulation in Austria



Industrial Sector	Note
<b>Positive list in Annex VI of the EU-BSS:</b>	
<b>Extraction of rare earths from monazite</b>	The formulation in the Natural Radiation Sources Ordinance (NatStrV) is more general.
<b>Production of thorium compounds and manufacture of thorium-containing products</b>	Primarily abrasives
<b>Processing of niobium/tantalum ore</b>	No sites could be found in Austria.
<b>Oil and gas production</b>	
<b>Geothermal energy production</b>	A pilote study is intended.
<b>TiO<sub>2</sub> pigment production</b>	No sites could be found in Austria.
<b>Thermal phosphorus production</b>	
<b>Zircon and zirconium industry</b>	
<b>Production of phosphate fertilisers</b>	
<b>Cement production, maintenance of clinker ovens</b>	Fly ashes, slag sand, maintenance of clinker ovens (if not SiC coated)
<b>Coal-fired power plants, maintenance of boilers</b>	Fly ashes, maintenance of boilers
<b>Phosphoric acid production</b>	
<b>Primary iron production</b>	
<b>Tin/lead/copper smelting</b>	
<b>Ground water filtration facilities</b>	The formulation in §2 Z 3a) NatStrV is more general.
<b>Mining of ores other than uranium ore</b>	The formulations in §2 Z 3b) and g) NatStrV are more general

# Clarification of the scope of the regulation



Industrial Sector	Note
<b>Natural Radiation Sources Ordinance (NatStrV):</b>	
<b>Industrial or commercial use of thorated welding electrodes, if &gt; 300 h per person and year</b>	See §2, number 2c) of the NatStrV
<b>Industrial or commercial use of other thorated products than those mentioned above</b>	See §2, number 2d) of the NatStrV
<b>Industrial or commercial practises with residues according to §2, number 3 of the NatStrV</b>	See §2, number 2j) of the NatStrV
<b>Radon-spas and -facilities</b>	See §2, number 3c) of the NatStrV
<b>Processing of ores</b>	See §2, number 3g) of the NatStrV
<b>Industrial steam-boiler plants using solid fossile fuels</b>	See §2, number 3l) of the NatStrV

# Identification of practises



Identifications of NORM industrial sectors were carried out based on literature review and experience with focus on the situation in Austria:

- Reports
- Peer reviewed literature
- IAEA-documents
- Experiences from the current regulation practise

This also allows for an identification of radiologically relevant sub-sectors and secondary processes.

Identifications of gaps of knowledge about radiological risks and the resulting need for pilote studies!

# Industrial or commercial practises with residues:



Examples: Service or maintainance in context with scales in pipelines, industrial ovens, boilers, etc. and decommissioning.



# Example: Geothermal energy production



- Depths for the sites in Austria vary from 1400 to ca. 2850m.
- Seven sites in Austria were identified for deep geothermal energy production.
- Most of the sites are situated in Upper Austria, two in Styria.
- No information about radionuclides in these geothermal sites could be found.

# Literature from investigated German deep geothermal springs:



- *Gärtner and Tachlinski (2013)*:  $^{226}\text{Ra}$ ,  $^{228}\text{Ra}$  including their decay products and  $^{40}\text{K}$  as main sources of radioactivity
- *Köhler and Degering (2014)*: Salish residues: up to 2000 Bq/g; combustible residues: up to 200 Bq/g, metal-scrap: up to 2 Bq/g.
- Considerable variations between different locations in Germany with respect to radioactivity in investigated materials.

**→ Need for a pilote study in Austria.**



# Conclusions



- Exemptions from notification and authorization as well as licencing are intendend to be applied in Austria.
- Concepts for the different levels of the graded approach plus their criteria are in progress.
- The Austrian Standards for the required dose assessment will be adjusted for the revised regulatory control.
- Available information about radiological risks is collected for the different NORM-industrial practises in Austria.
- For several industries more data will be needed, examples:
  - Geothermal energy production
  - Ground water filtration facilities
  - Mining of ores other than uranium ore

# Thank you for your attention!

## Literature:

- Gärtner, S.G., Tachlinski, S., 2013 (in German): Geothermie und Strahlenschutz – Strahlenschutztechnisch bedeutsame Fragestellungen. Strahlenschutzpraxis 2, p. 45-50.
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