The European ALARA$_{\text{NORM}}$ Network
– contribution to reducing radiation exposure at NORM workplaces

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European ALARA\textsubscript{NORM} Network (1)

Start of the NORM network in 2007, first 2 years funded by EC, establishment of database and network

**Aims:**

- implementation of ALARA principles in the non-nuclear industry
- exchange of information on regulations, administrative procedures and RP measures, experience between experts of different branches/countries

**website** [www.ean-norm.net](http://www.ean-norm.net) - internet portal online support: information on contacts, authorities, organisations, events, documents (recommendations and directives, national legislation, decision support and scientific information concerning NORM related topics)
European ALARA\textsubscript{NORM} Network (2)

- stable network developed: 2012 > 200 registered members
- 44 contact points from 23 countries within Europe
European ALARA$_{NORM}$ Network (2)

• organised 4 topical workshops with discussion of legal/practical issues in RP like administrative procedures, strategies, transport, dose assessments…

• *next workshop 4$^{th}$ - 6$^{th}$ Dec. 2012 in Dresden, Germany “Measurement strategies in NORM”*

• 2011- Support for industries/authorities dealing with NORM: Leaflets for the zircon industry and oil & gas industry for download in English/ German version

• *NORM industries will belong to planned situations (EU BSS)* → check existing facilities and prepare persons responsible!
Leaflet for zircon industry (1)

Evaluation and control of radiation exposure of workers in the zircon industry (practical advice):

• Specific activities in raw materials
• Legal requirements (Dir. 96/29 EURATOM, draft EU BSS)
• Determination of radiation exposure (scenarios, pathways, calculations, measurements)
• RP during transport
• RP measures
• Residues

Dose rate measurement at zircon sand storage
Leaflet for zircon industry (2)

- Information on chemical/physical processes during production with conclusions for RP control
- Relevant pathways for exposure of workers
- Instruction for proper RP measurements (γ-radiation, dust, radon/progenies…)
- Dose calculation in detail (formulas, parameters, standards)
- Practical experience

Dust collection by Berner-impactor
Leaflet for zircon industry (3)

**RP measures**: integrate into general H&S-procedures

**specific:**
- preferable use materials with lower activity → optimisation
- identify main sources of dust, keep them under control
- use containment/ventilation to reduce workplace dust levels, respiratory protective equipment
- optimise location of bulk materials, working time there → reduction of external doses

*(German: AAAA – Aktivität, Abschirmung, Abstand, Aufenthaltszeit)*

**general:**
- good practice developed regarding health hazards
- specific measures depending on particular workplace situation
- priority of measures: **Technological – Organisational – Personal**

(TOP)
Materials by authorities

Minerals Containing Natural Radioactivity

Radiation at Work

Materials by authorities
Materials by industrial associations

The European Network on Silica – Good practice guide: www.nepsi.eu – downloads in many languages

2.1.1 Cleaning

This activity relates to cleaning of surfaces in the workplace of substances, which may contain a proportion of crystalline silica dust. Cleaning should be carried out in a routine basis, but may also be required in response to spillage of a substance containing crystalline silica.

Access
- Restricted access to the work area to authorised personnel only.

Design and equipment
- Wet cleaning:
  - Dust control can be achieved using wet cleaning methods, which prevent the dust from becoming airborne by keeping it in water.
  - Wet cleaning methods may involve mopping, wet brushing or the use of water sprays or hoses.
- If water sprays are used, ensure that water supplies are adequate and that they are maintained. Take extra precautions during cold weather to protect against freezing.
- When wetting wall spillages of fine, dry dust material it is best to use a fine mist. The use of a jet of water will cause dust to become airborne.
- Where wet cleaning methods are used, electrical installations must be designed with protection against water ingress.
- The provision of appropriate drainage systems is essential when using water sprays and hoses.

2.1.15 Personal protective equipment (PPE)

This guidance sheet is aimed at employees to help them comply with the requirements of workplace health and safety legislation, by controlling exposure to respirable crystalline silica.

Access
- Equipment should be maintained in a clean and operational condition. It is important to ensure that the PPE is clean and operational to protect the user.

Design and equipment
- Protective clothing should be selected and worn in accordance with the risk assessment and job instructions. The PPE should be appropriate for the task and the level of risk.
- PPE should be maintained in a clean and operational condition. It is important to ensure that the PPE is clean and operational to protect the user.
- Personal protective clothing should be selected and worn in accordance with the risk assessment and job instructions. The PPE should be appropriate for the task and the level of risk.
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2.1.10 Good hygiene

This guidance sheet is aimed at employees to help them comply with the requirements of workplace health and safety legislation, by controlling exposure to respirable crystalline silica.

Access
- Ensure that all employees are aware of the risks associated with the work.

Design and equipment
- Personal protective clothing (PPC) should be selected and worn in accordance with the risk assessment and job instructions. The PPC should be appropriate for the task and the level of risk.
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Leaflet for oil & gas industry (1)

Practical advice on the evaluation and control of radiation exposure of workers in the oil & gas industry:

• origin, occurrence of radioactivity and specific activities in residues
• legal requirements (Dir. 96/29 EURATOM, draft EU BSS)
• determination of radiation exposure (scenarios, pathways, calculations, measurements)
• RP measures, during transport
• residues (management, disposal)
Leaflet for oil & gas industry (2)

- information on chemical/physical processes during production with conclusions for RP control
- relevant pathways for exposure of workers
- instruction for proper RP measurements (γ-radiation, dust, radon/progenies…)
- dose calculation in detail (formulas, parameters, standards)
- practical experience
Leaflet for oil & gas industry (3)

RP measures: integrate into general H&S-procedures

specific:
• do systematic surveys/ measurements to detect radioactive contamination
• avoid dust generation (cutting, cleaning), keep it under control
• prevent spreading radioactive contamination
• optimise working time at relevant places, review in reasonable intervals → reduction of effective doses
• use respiratory protective equipment (esp. during maintenance)
• wear protective clothing → TOP order of measures

general:
• specific measures depending on particular workplace situation
• good practice developed regarding health hazards
Materials by industrial associations

→ Experience in health & safety management, advice dealing with hazardous materials

Guideline of the “International organisation of Oil and Gas Producers”
General conclusions

1. RP should always be included into H&S procedures, there are similar requirements
2. Analyse process to detect relevant pathways/places and find optimisation options (ALARA) like shielding, ventilation, cleaning… with priority in TOP order
3. Do realistic dose assessments
4. Pay special attention to stay (distance, time) and dust/ dirt
5. Do systematic measurements/ surveys
6. Keep workers informed
7. Use of protective equipment
8. Specific measures depending on particular workplace situation
9. Care for proper residues disposal, environmental impact and possible exposures to the public
Network cooperation and future

- 20 – 30 members of EAN\textsubscript{NORM} interested in discussion on leaflets; 7 – 11 members sent comprehensive comments on it
- leaflets in English and German version at the EAN\textsubscript{NORM} website, NORM survey (O&G industry coming soon)
→ broad European experience, esp. from the industry

View into the future:
- preparation of additional leaflets for relevant industries?
- further development of the EAN\textsubscript{NORM} network
- implementation of coming EU-BSS and its consequences
- remember next workshop: 4\textsuperscript{th} - 6\textsuperscript{th} Dec. 2012 in Dresden, Germany, “Measurement strategies in NORM”
Thank you for your attention!

For further questions:

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