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

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European ALARA$_{NORM}$ Network (1)

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

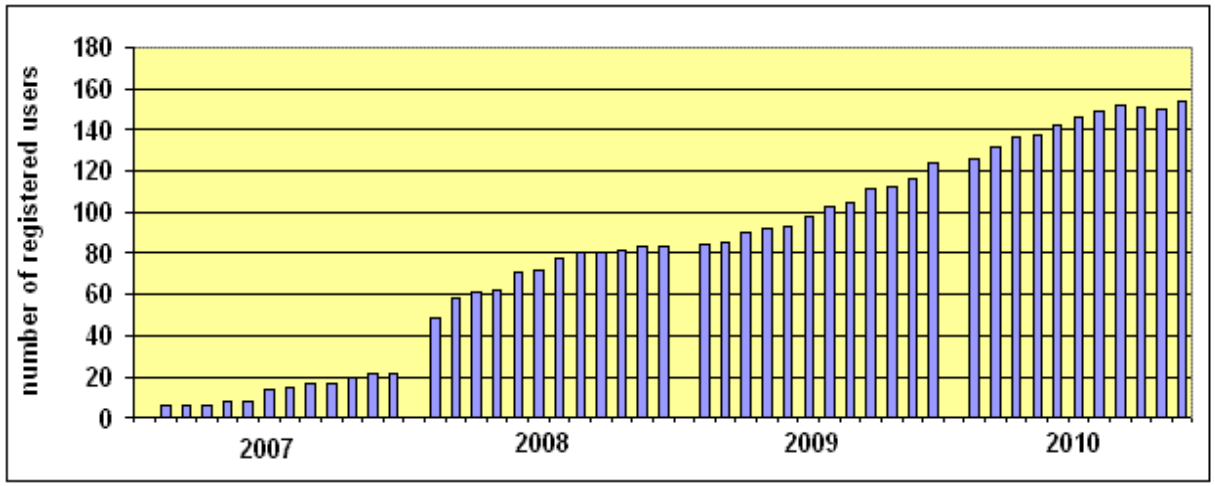
Aims:

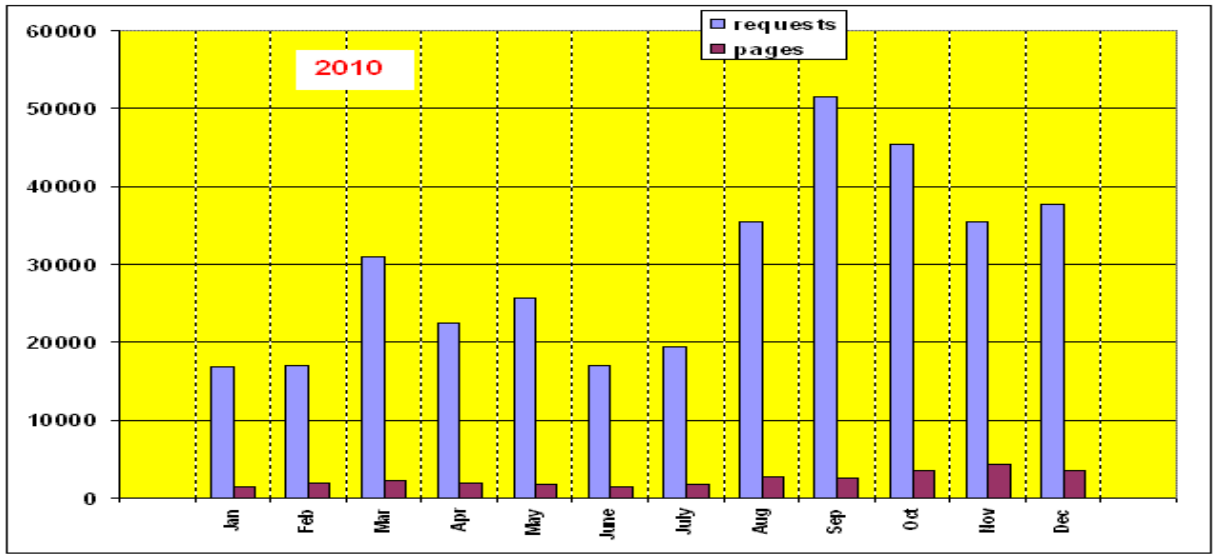
- implementation of ALARA principles in the non-nuclear industry
- exchange of information on regulations, administrative procedures and RP measures, experience between experts of different branches/countries

website www.ean-norm.net - 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$_{NORM}$ 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 4th - 6th 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:

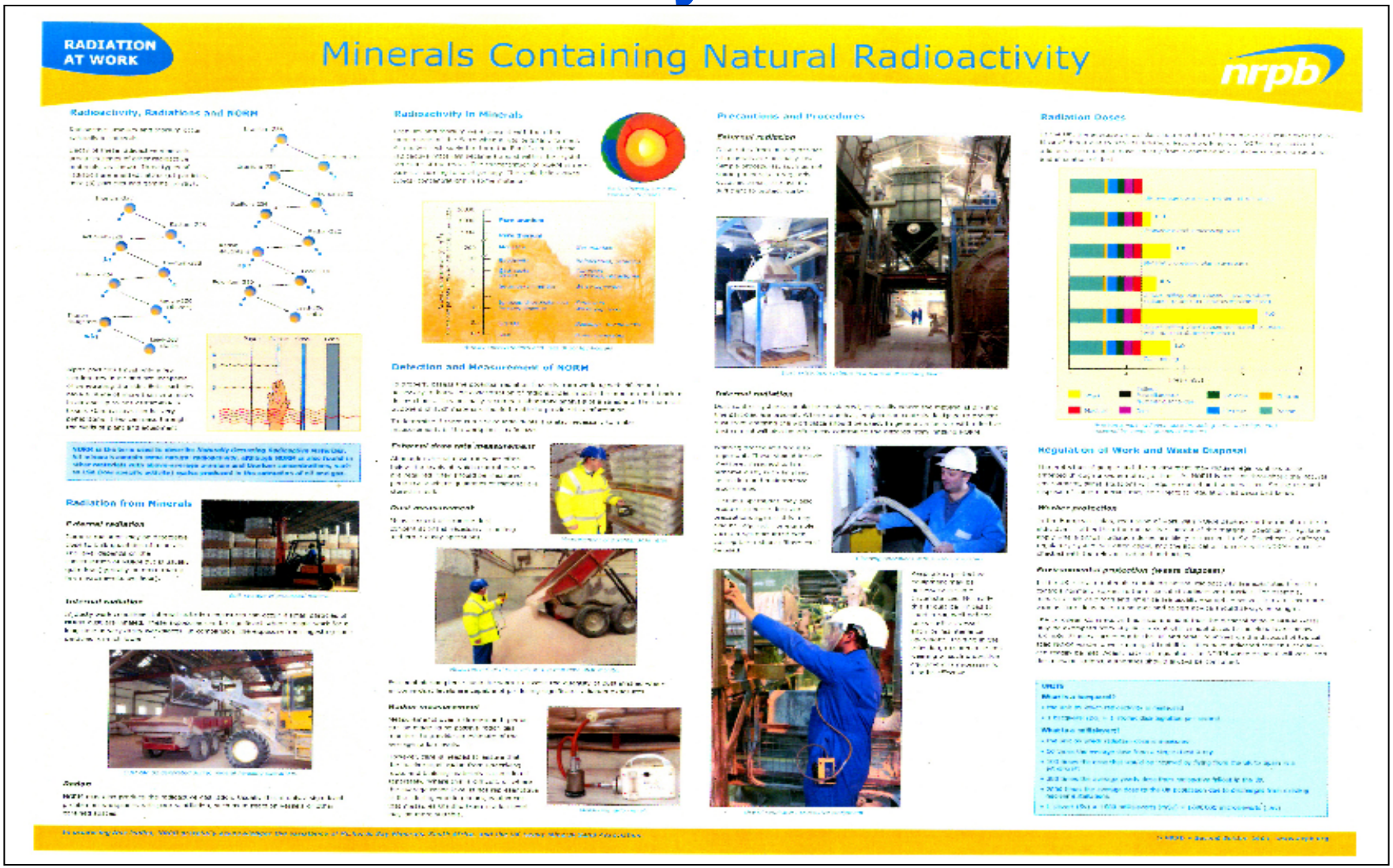
- preferable use materials with lower activity → optimisation
- identify main sources of dust, keep them under control
- use containment/ventilation to reduce workplace dust levels, respiratory protective equipment
- optimise location of bulk materials, working time there → reduction of external doses

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

general:

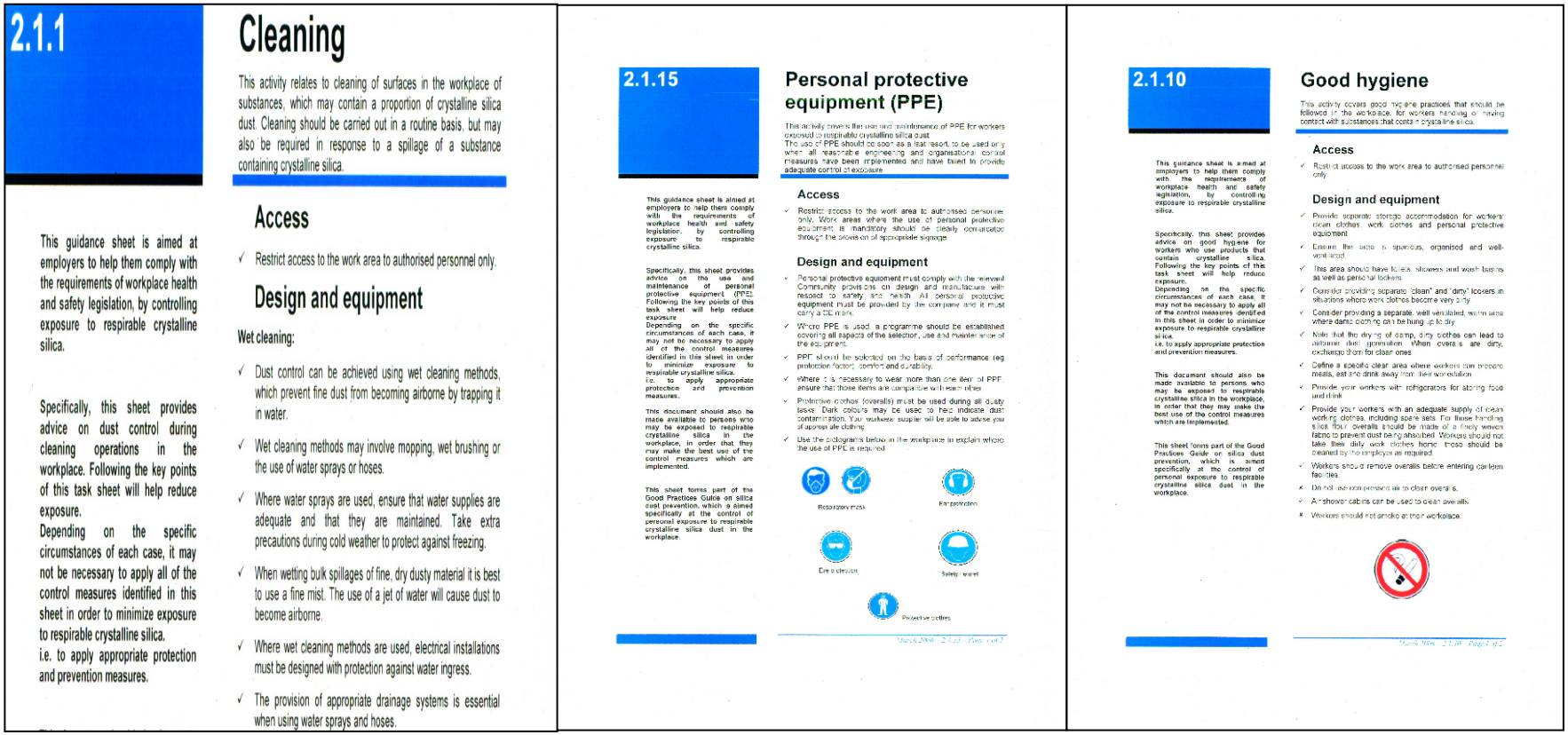
- good practice developed regarding health hazards
- specific measures depending on particular workplace situation
- priority of measures: **T**echnological – **O**rganisational – **P**ersonal (TOP)

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 a spillage of a substance containing crystalline silica.

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

Specifically, this sheet provides advice on dust control during cleaning operations in the workplace. Following the key points of this task sheet will help reduce exposure.
Depending on the specific circumstances of each case, it may not be necessary to apply all of the control measures identified in this sheet in order to minimize exposure to respirable crystalline silica.
i.e. to apply appropriate protection and prevention measures.

Access

- ✓ Restrict 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 fine dust from becoming airborne by trapping it in water.
- ✓ Wet cleaning methods may involve mopping, wet brushing or the use of water sprays or hoses.
- ✓ Where 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 bulk spillages of fine, dry dusty 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 activity covers the use and maintenance of PPE for workers exposed to respirable crystalline silica dust.
The use of PPE should be seen as a last resort, to be used only when all reasonable engineering and organisational control measures have been implemented and have failed to provide adequate control of exposure.

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

Specifically, this sheet provides advice on the use and maintenance of personal protective equipment (PPE). Following the key points of this task sheet will help reduce exposure.
Depending on the specific circumstances of each case, it may not be necessary to apply all of the control measures identified in this sheet in order to minimize exposure to respirable crystalline silica.
i.e. to apply appropriate protection and prevention measures.

This document should also be made available to persons who may be exposed to respirable crystalline silica in the workplace, in order that they may make the best use of the control measures which are implemented.

This sheet forms part of the Good Practices Guide on silica dust prevention, which is aimed specifically at the control of personal exposure to respirable crystalline silica dust in the workplace.

Access

- ✓ Restrict access to the work area to authorised personnel only. Work areas where the use of personal protective equipment is mandatory should be clearly demarcated through the provision of appropriate signage.

Design and equipment

- ✓ Personal protective equipment must comply with the relevant Community provisions on design and manufacture with respect to safety and health. All personal protective equipment must be provided by the company and it must carry a CE mark.
- ✓ Where PPE is used, a programme should be established covering all aspects of the selection, use and maintenance of the equipment.
- ✓ PPE should be selected on the basis of performance (eg protection factor), comfort and durability.
- ✓ Where it is necessary to wear more than one item of PPE, ensure that those items are compatible with each other.
- ✓ Protective clothes (overalls) must be used during all dusty tasks. Dark colours may be used to help indicate dust contamination. Your workwear supplier will be able to advise you of appropriate clothing.
- ✓ Use the pictograms below in the workplace to explain where the use of PPE is required.

2.1.10

Good hygiene

This activity covers good hygiene practices that should be followed in the workplace, for workers handling or having contact with substances that contain crystalline silica.

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

Specifically, this sheet provides advice on good hygiene for workers who use products that contain crystalline silica. Following the key points of this task sheet will help reduce exposure.
Depending on the specific circumstances of each case, it may not be necessary to apply all of the control measures identified in this sheet in order to minimize exposure to respirable crystalline silica.
i.e. to apply appropriate protection and prevention measures.

This document should also be made available to persons who may be exposed to respirable crystalline silica in the workplace, in order that they may make the best use of the control measures which are implemented.

This sheet forms part of the Good Practices Guide on silica dust prevention, which is aimed specifically at the control of personal exposure to respirable crystalline silica dust in the workplace.

Access

- ✓ Restrict access to the work area to authorised personnel only.

Design and equipment

- ✓ Provide separate storage accommodation for workers' clean clothes, work clothes and personal protective equipment.
- ✓ Ensure the area is spacious, organised and well-ventilated.
- ✓ This area should have toilets, showers and wash basins as well as personal lockers.
- ✓ Consider providing separate 'clean' and 'dirty' lockers in situations where work clothes become very dirty.
- ✓ Consider providing a separate, well ventilated, warm area where damp clothing can be hung up to dry.
- ✓ Note that the drying of damp, dirty clothes can lead to airborne dust generation. When overalls are dirty, exchange them for clean ones.
- ✓ Define a specific clear area where workers can prepare meals, eat and drink away from their workstation.
- ✓ Provide your workers with refrigerators for storing food and drink.
- ✓ Provide your workers with an adequate supply of clean working clothes, including spare sets. For those handling silica 'dust' overalls should be made of a finely woven fabric to prevent dust being absorbed. Workers should not take their dirty work clothes home; these should be cleaned by the employer as required.
- ✓ Workers should remove overalls before entering canteen facilities.
- ✗ Do not use compressed air to clean overalls.
- ✓ Air shower cabins can be used to clean overalls.
- ✗ Workers should not smoke at their workplace.

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

Cleaning of pipes

Leaflet for oil & gas industry (3)

RP measures: integrate into general H&S-procedures

specific:

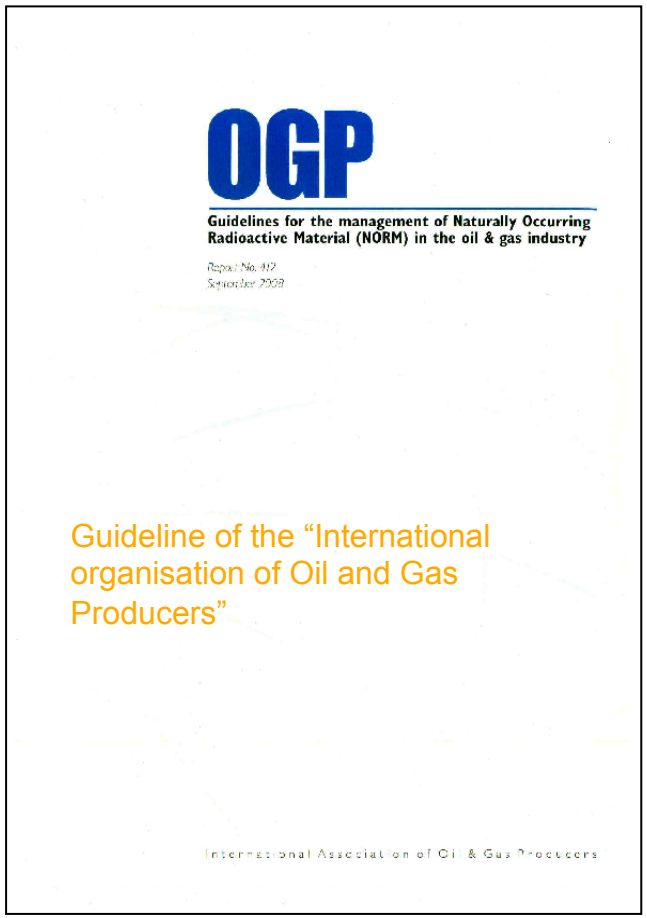
- do systematic surveys/ measurements to detect radioactive contamination
- avoid dust generation (cutting, cleaning), keep it under control
- prevent spreading radioactive contamination
- optimise working time at relevant places, review in reasonable intervals → reduction of effective doses
- use respiratory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

general:

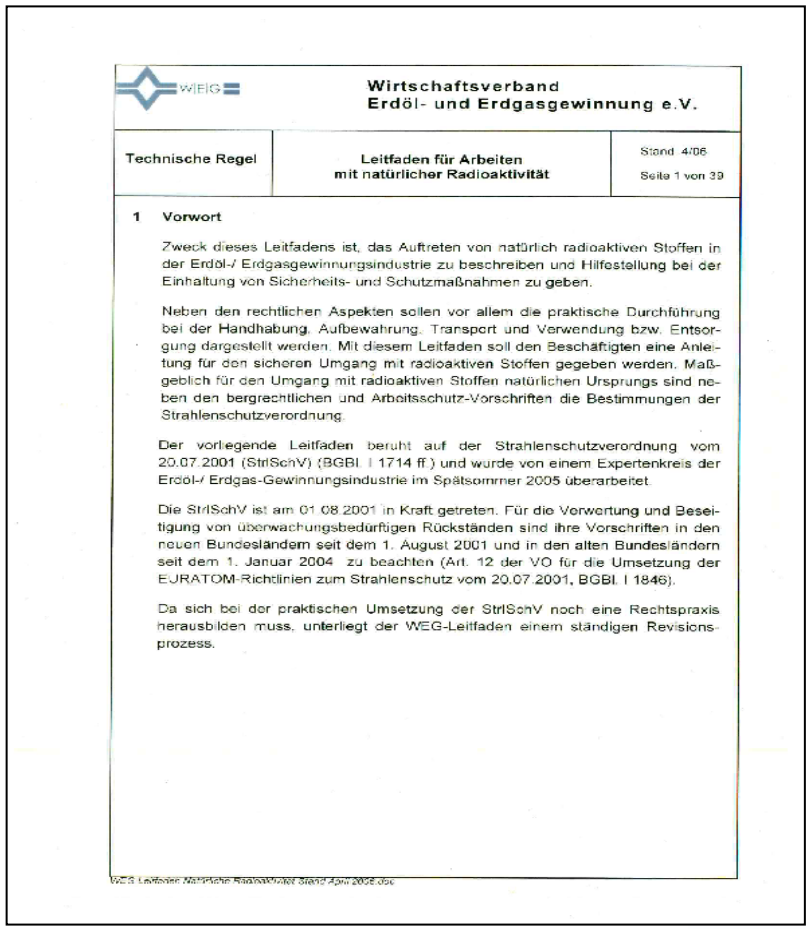
- specific measures depending on particular workplace situation
- good practice developed regarding health hazards

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_{NORM} interested in discussion on leaflets; 7 – 11 members sent comprehensive comments on it
- leaflets in English and German version at the EAN_{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_{NORM} network
- implementation of coming EU-BSS and its consequences
- remember next workshop: *4^{th} - 6^{th} Dec. 2012 in Dresden, Germany, "Measurement strategies in NORM"*

Thank you for your attention!

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