

The challenge

RP

(Natural)
radioact. substances

residues

Occupational
exposures

Regulations, limits
authorization, ...

Protection of
environment

NORM

U, Ra, Th Hg, As, ...



Protect humans and
the environment against
adverse effects

HSE

Toxic substances

waste

Occupational
exposures

Regulations, limits
authorization, ...

Environmental
Protection

The substances

RP

Natural
radioact. substances

Carcinogenic substances
(ionizing radiation)

Linear non-threshold
effects

NORM

U, Ra, Th Hg, As, ...

HSE

Natur. & artificial
toxic substances

Non-carcinogenic

Carcinogenic with
effect threshold

Carcinogenic subst.
without effect threshold

The concepts

RP
for NORM

(Justification)

Limitation

Optimization
(ALARA)

Cardinal rules
of behavior

Instruction

NORM

U, Ra, Th Hg, As, ...



Manage the risks

HSE

for carcinogenic
substances

Avoidance

Limitation

?

Basic rules
of behavior

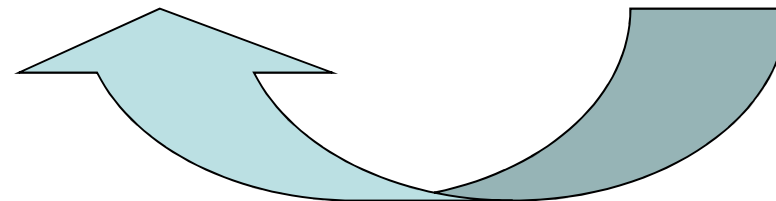
Instruction

The German Risk Acceptance Concept

- In 2008 the German Committee of hazardous substances (AGS) has adopted a new concept of occupational health and safety regarding carcinogenic substances. This concept replaces the formerly used concept of technical exposure limits (TRK) and intends to introduce a process of reasonable exposure reduction.
 - Deals with hazardous carcinogenic substances.
- ? How this concept is transferable to the radiation protection of NORM and what benefits could be result from its application?

HSE
for carcinogenic
substances

?





The German Risk Acceptance Concept

Available in English:

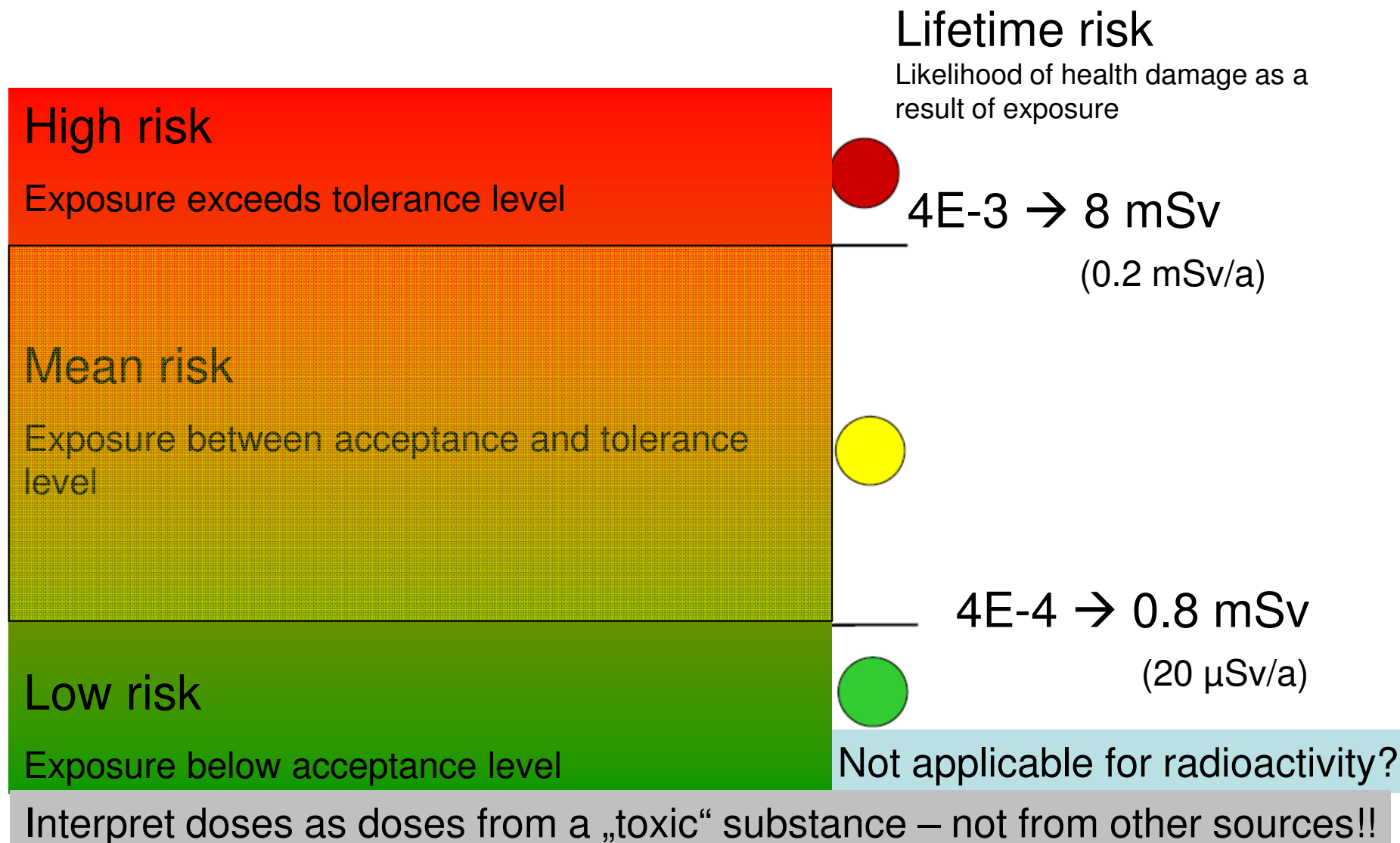
<http://www.baua.de/en/Topics-from-A-to-Z/Hazardous-Substances/TRGS/Announcement-910.html>

Announcement 910 Page - 1 -

Version: June 2008

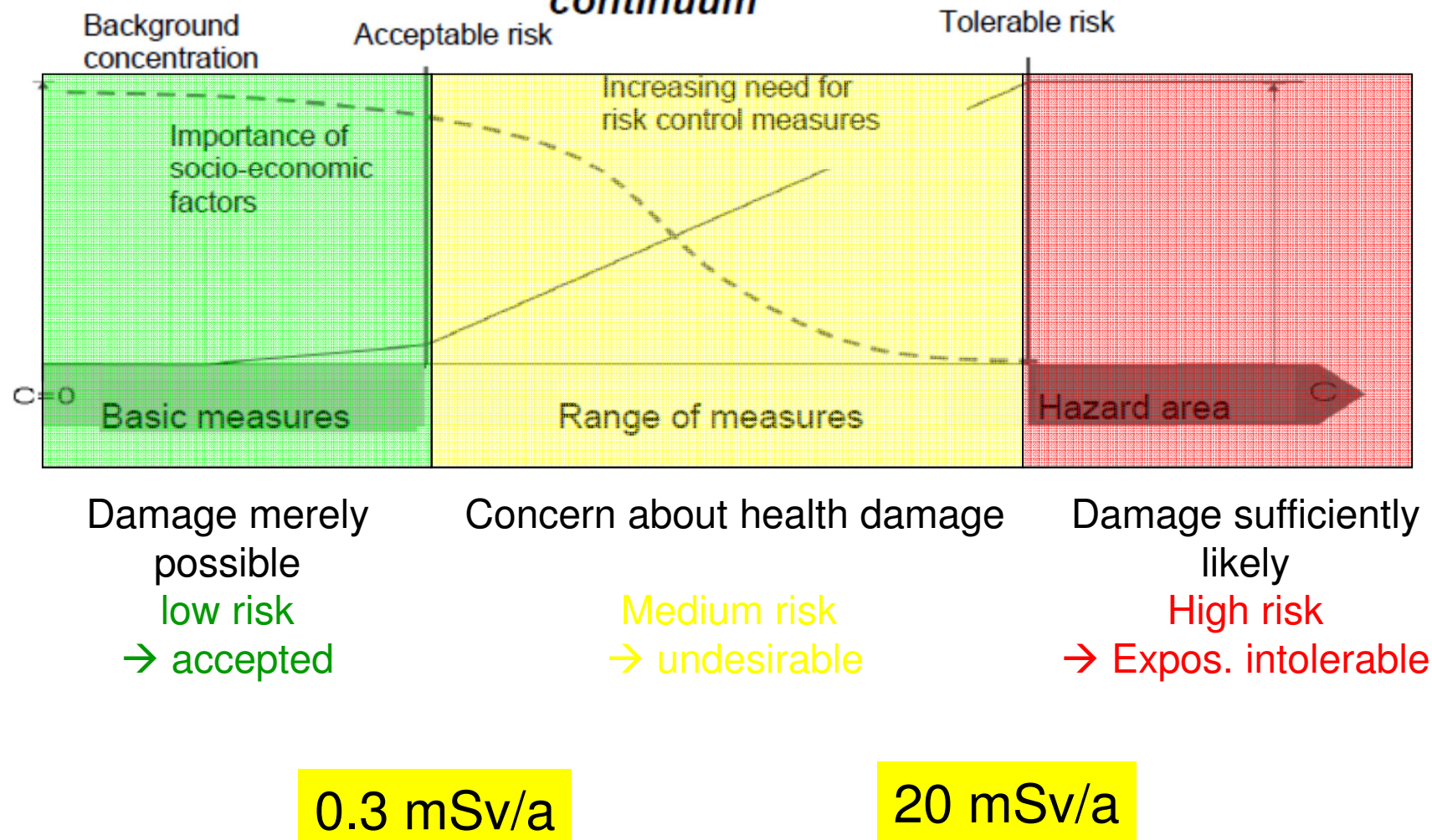
Announcement on Hazardous Sub- stances	Risk figures and exposure-risk rela- tionships in activities involving carcinogenic hazardous sub- stances	Announcement 910
---	---	-----------------------------

Risk continuum and break points



Risk acceptance concept

Priorities of possible measures in the risk continuum



Measures - Graduated risk control (*)

Administrative measures

- Prohibition
- Conditional approval
- Communication with supervisory authority
- Plan for actions

Technical measures

- Technical measures
- Isolation (if appropriate)
- Reducing relevant quantities
- Respiratory protection
- Minimizing exposures

Organizational measures

- Basic hygiene measures
- Minimizing duration of expos.
- Risk transparency and communication
- Operating instructions, advisories, training

Preventive medical measures

- Voluntary check-up
- Mandatory check-up

Measures of substitution

- Checking
- Execute (if appropriate)

(*) Transferred from similar plans in the Netherlands

Conclusion 1

- The Risk Acceptance Concept gives a dynamic approach for dealing with hazardous substances without effect thresholds.
- Should not be reduced to the formal risk levels (which are rather low)
- Specifies requirements of the ALARA principle in a rather detailed way.
- May be used as a guideline for RP in the field of NORM.

Make the world easier – use synergy effects!

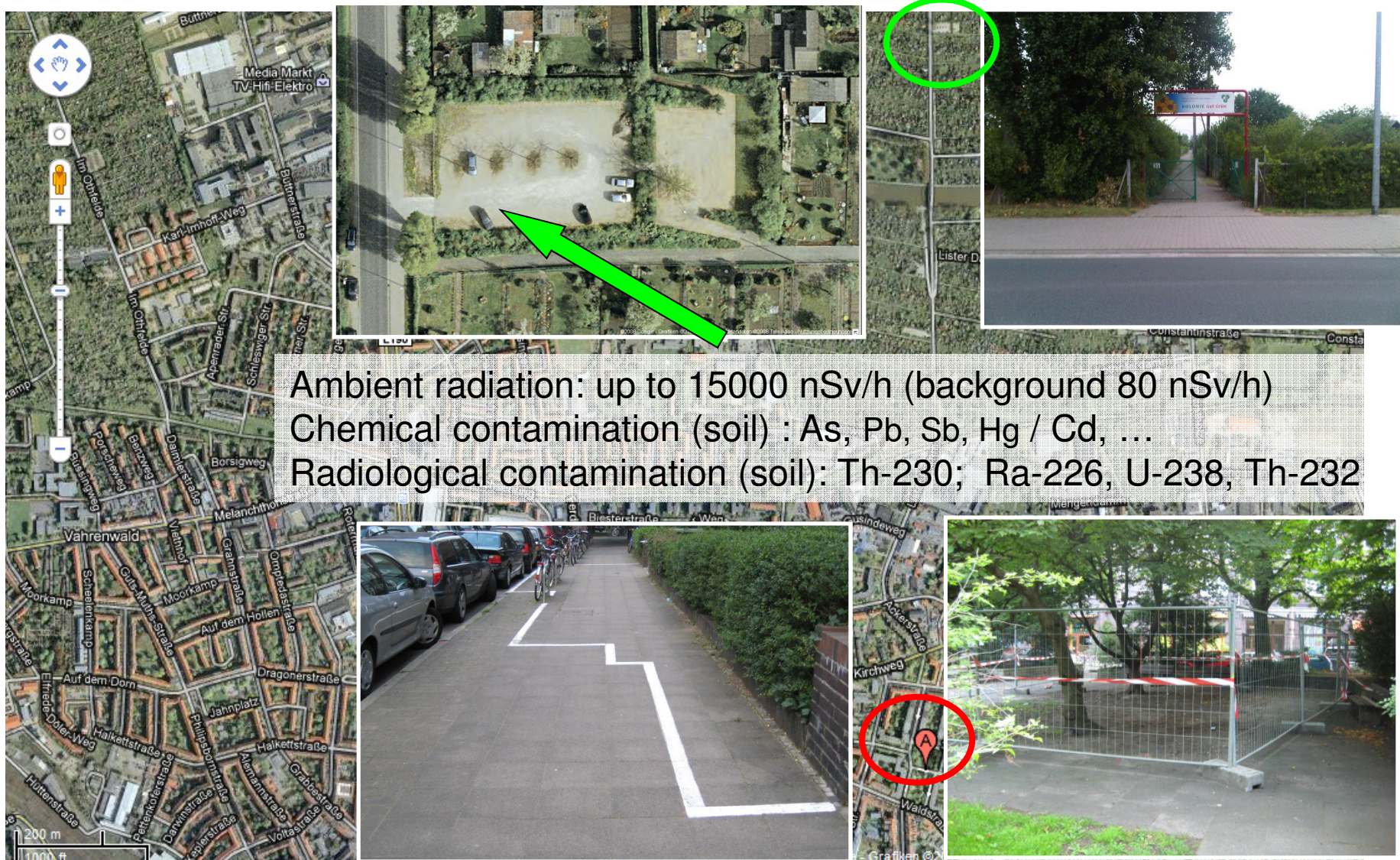
Practical example

Radioactive contaminated sites in Hanover

Experience from remediation measures
cf. presentation on EAN-NORM-Workshop Hasselt, 2011

http://www.ean-norm.net/lenya/ean_norm/images/pdf/workshop_4/presentationen/Gellermann.pdf

Situation in 2008 (*)



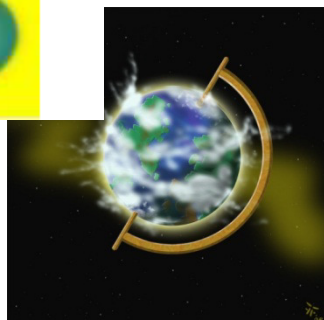
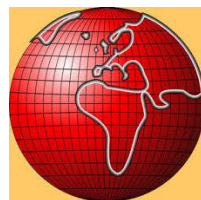
(*) Contaminated sites on ground owned by City of Hanover

Experience

- The involvement of affected people is of great importance. Factual information about the actual risks is necessary but not sufficient.
 - Radioactivity is perceived as a very special danger. Concerned people must be taken seriously, also if their concern seems causeless.
 - Documents that present the hazards of radioactive and chemical substances in a integrated framework makes the communication easier.
 - Remediation workers have usually no personal experience with radioactivity. But they accept radiation as “common” risk component (like other toxic substances), if it is clearly communicated as part of occupational safety.
 - Communication about hazards needs both: rational and emotional arguments.

In how many worlds will we live?

RP
for NORM



NORM

U, Ra, Th Hg, As, ...



HSE

for carcinogenic
substances



“Any fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction.” (A. Einstein)

→ Integrate different fields! / **Use synergies!**

Environmental Protection

BSS Article 76

- Member States shall include, in their legal framework for radiation protection provision for the radiation protection of non-human species in the environment. Where appropriate, **types of practices shall be identified** for which regulatory control is warranted in order to implement the requirements of this legal framework.

Practices include NORM → NORM-industries are probably more relevant for environmental effects than NPP!?

How to deal with environmental protection – do we need specific provisions of RP?

Conclusion 2

- There remain many interesting things to do / to discuss.

Thank you for attention