WAK

Wiederaufarbeitungsanlage Karlsruhe
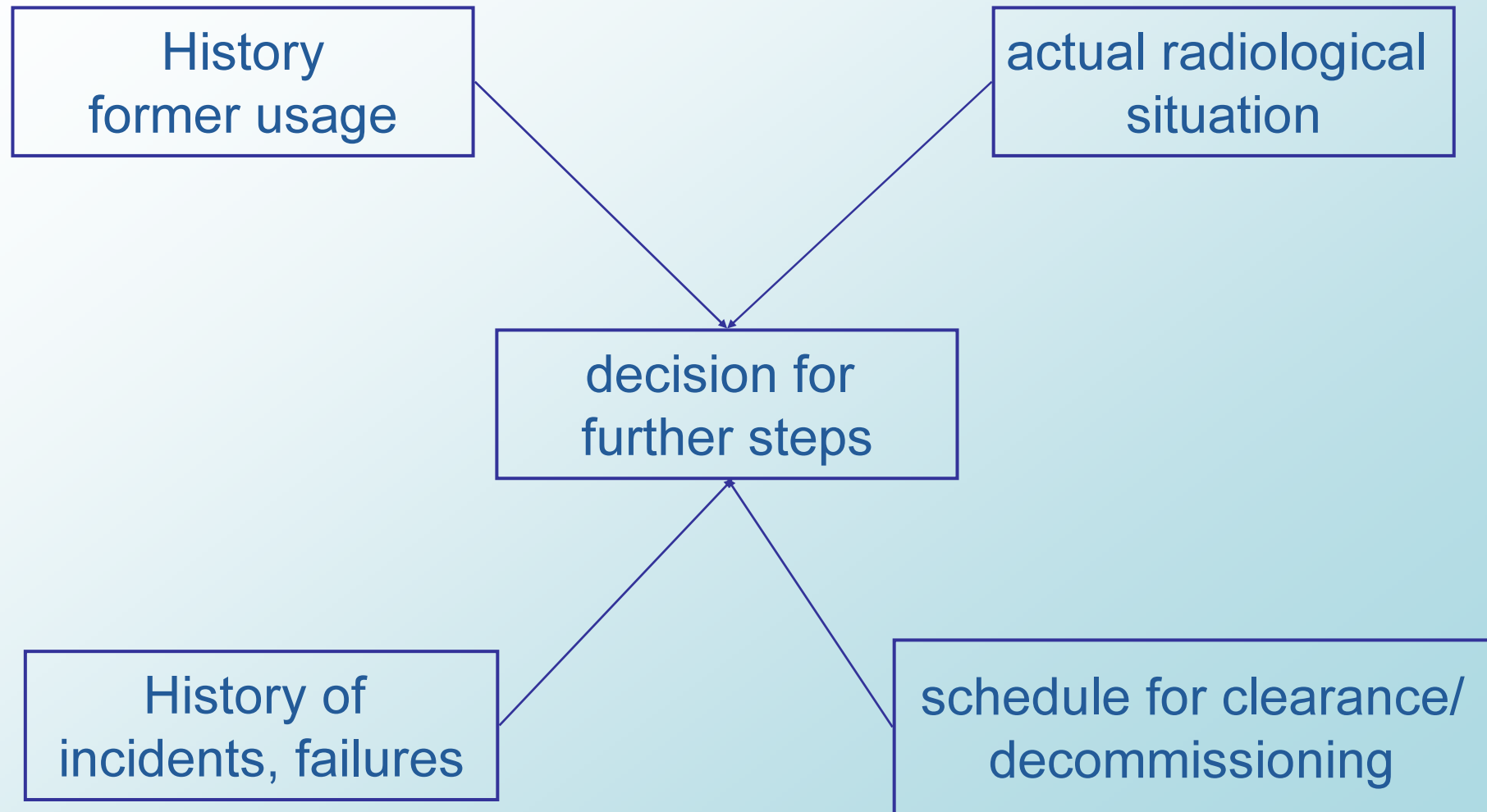**Rückbau- und Entsorgungs- GmbH**

Sampling for radionuclide analysis and radiological characterisation for clearance, storage transport and disposal

Michael Vilgis
Safety Department

08.07.2009

Steps

- Collect Informations

- Radiation Protection for workers

- objective (transport, disposal, clearance)

- Strategy/Plan for Sampling

  - Number, Documentation

  - contamination level

- Choice of sampling method with respect to analysis methods

History
former usage

actual radiological
situation

decision for
further steps

History of
incidents, failures

schedule for clearance/
decommissioning

Informations from History

- Dispersal pathway for contamination
  - water systems
  - waste air system
  - dust
- Borders of rooms, systems
- Range of radiation (in particular neutrons)
- Check of Log Books
- Nuclide spectrum expected

Radiation Protection

- Implementation of Radiation protection areas

- Measurements for the survey of actual radiological situation

- measures against dispersal and incorporation
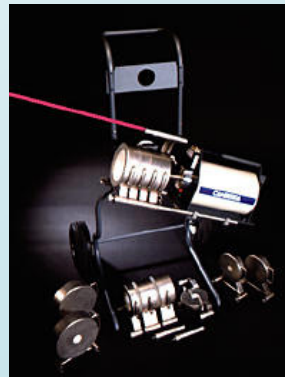
- protective measures for workers

Measurements

easy,
quick,
simple

quick information
overview

complex,
particularized

detailed information

Aspects for Sampling

- Distribution of Contamination
    - Activation / surface contamination / intruded contamination
    - homogenous / heterogenous
- Intention of Sampling: Nuclide vector or specific activity
- Required decision: Disposal or Clearance possible
- Decontamination useful?
- Volume, amount of batch
- Number of different materials (concrete, metal, etc.)
- Time schedule for dismantling / clearance
- Single sample, mixed samples
- Minimum activity for analysis method

Sampling in practice

marking and numbering

sampling under RP conditions

Sampling methods

- Surfaces
  - Wipe tests (if contamination is non-firmly adhering)
  - Scratch off (e.g. cover painting)
  - abrasion
- Solid Materials
  - Drilling (chips, dust, drill cores for depth distribution)
  - Cutting
  - (small) parts

- Attention:
  - sampling method with respect to nuclides to be identified (e.g. H-3)
  - samples preparation with respect to radiochemical analysis or measurements

Number of samples

	category 1	category 2	category 3
area related measurements for objects in 1/m²	1	1/3	1/10
mass related measurements in 1/kg	1/100	1/1000	1/10000
area related measurements for buildings in 1/m²	1	1/2	1/20
area related measurements for ground in 1/m²	1/10	1/100	1/1000

Representative Samples!

- for the complete batch of material
- for a box, drum, container

Conclusion

- Knowledge of history

- Actual radiological situation

- Distribution of activity

- Objective of sampling

- Representative samples

Thank you
for your attention

WAK