Regulations on radioactive waste from practices using unsealed radioactive sources

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Preparing new regulations

- Regulations are based on the Swedish Radiation Protection Act (SFS 1988:220) and the Radiation Protection Ordinance (SFS 1988:293)
- Solutions for regulating waste disposal that limit doses to the public, below 10 µSv/a per person from releases from each practice
- Does environmental protection need to be considered?
- Close relations to environmental regulations on waste management

Harmonisation with regulations on releases from nuclear facilities - similarities

- Same dose limit/dose constraint for public exposure
- Requirements on optimisation and maybe also the use of best available technique, BAT
  - What is BAT? Environmental protection? Is there a need for it?
- Requirements on quality control and documentation
- Reporting (limited for non-nuclear facilitities)

Harmonisation with regulations on releases from nuclear facilities - differencies

- Very different types of licence holders
- Radio nuclides
- Waste quantity and characteristics
- Waste streams
- Exposure scenarios

There is need for separate regulations!

Waste streams – unsealed sources

Gaseous → atmosphere

Liquid waste → municipal sewer system → wastewater treatment
plant worker → sludge
→ water

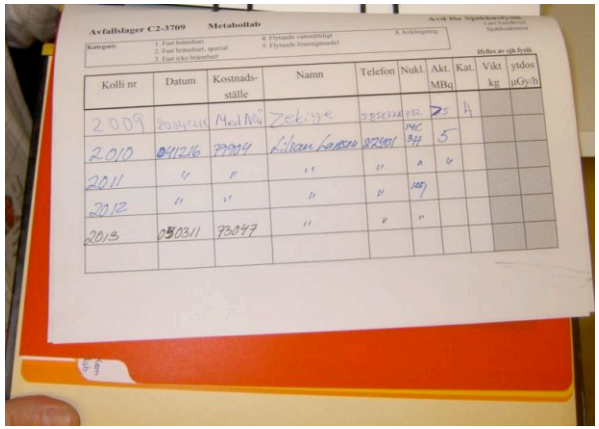
Solid waste → incineration → atmosphere
→ ashes

Higher activities → special treatment
(or special permission for disposal from the authority)

Waste management –unsealed sources

Proposal on regulation

- Waste management must be included in the optimization of the practice. Waste management and final disposal must be planned for in an early stage and documented before a practice starts or an existing practice increases its use of radio nuclides



Quality control and record keeping

Proposal on regulation

- Written instructions for waste management and disposal, and methods for estimating the activity in the waste
- Records of
  - Activity in the waste sent for incineration or to sewer system
  - Activity in the stored waste, radio nuclides, identity, origin
  - Activity in the waste sent to special treatment

Release to air –unsealed sources

Proposal on regulation

- Concerns practices with significant releases to air such as cyclotrones and H-3 and C-14 manifold systems
- Practices have to calculate the dose to representative person from releases to air. When the calculated dose is 10 µSv/year or more, the licenceholder must calculate for a realistic scenario. If the realistic scenario is above 10 µSv/year the supervising authority must be notified
- Releases to air must be reported to the authority every year

Liquid and solid waste

Proposal on regulation

- Nuclide specific activity limits for releases to the sewer system or incineration
- The activity limits used today are in the same range as exemption levels. Why not use an existing list?
- Ten times the activity can be disposed for solid as well as liquid waste every month

- Patient excreta is exempted from regulation
  - Holding tanks are not concidered justified

Dose assessments

Wastewater treatment plants:

1. Modelling; conservative assuptions
2. Visits and questionnaires: where are the workers? How is the sludge used?
3. Low doses thanks to reducing uncertainties

Incineration

- No physical contact with the waste at the incineration plant; it is already classified as (bio-)hazardous
- Calculations on the most critical incineration plant
  - Dispersion in air
  - Concentration in ash

Conclusions

- Regulation must be simple and easy to use, both for the licence holders and the authority
- Provide the same level of radiation protection for all practises but use different methods for waste management and disposal