

Swedish Experiences of using Radiation Protection Legislation in the NORM- Industries

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The Swedish Radiation Protection Legislation

In the current legislation no difference is made between "Practices" and "Work activity".

This implies that all undertakings handling radioactive material are seen as "practices", and if the activity concentrations exceed the exemption values of the BSS they have to apply for a license.



The Swedish Radiation Protection Legislation

In the work with transposing the BSS directive into Swedish regulations 2000 the government decided NOT to include naturally occurring radionuclides in the Radiation Protection Act.

Work activities and cosmic radiation should be dealt with by the Work Environment Act (like before!)



The Swedish Radiation Protection Legislation

In a later interpretation (since 2006) the ministry has decided to declare handling of NORM and NORM wastes as a practice according to the Radiation Protection Act. This has implications on the requirements on licensing of practices when the material exceeds the exemptions levels.



The Swedish Radiation Protection Legislation

The legislation was changed rather recently and has not been fully implemented in the NORM-activities.

SSI is presently investigating how to handle NORM-wastes, as e.g. filters from water treatment plants and scales from large industrial water consumers.



The Swedish Radiation Protection Legislation

So for the moment different activities are handled on an ad hoc basis, patch-wise.

Different activities are thus not handled consistently. But work on this is considered highly urgent.



The Swedish Radiation Protection Legislation

The former legislation exempted a radioactive substance that didn't exceed 100 kBq/kg and NORM with higher activity concentration if it had not been treated to increase the concentration, but these exemptions are not present in the new version. Exemption now goes by the BSS exemption values.



Additional regulations

The Environmental Objective- A safe radiation environment states that by 2010 the additional individual dose to members of the public should be lower than 0.01 mSv/a from each individual operation. Naturally occurring radionuclides are not excluded.



Examples - 1

Areas where the legislation has been applied so far are Uranium prospecting and handling of tree fuel ashes contaminated by caesium-137 from large energy producers.

Areas foreseen for regulation, in the near future, is the handling of peat fuel and ashes from large energy producers.



Examples - 2

NORM industries

Pellet plants, steel works and cement and phosphate production have been assessed to give $< 10 \mu\text{Sv/a}$ to the public. Thus they are exempted.

The use of fertilizer may cause doses $> 10 \mu\text{Sv/a}$ to the public, but it's not regulated.



Examples - 3

Cosmic radiation in aircraft operations

Air crews can receive considerable doses. Their situation is regulated by the Work Environment Act.

Flying may cause doses $> 10 \mu\text{Sv/a}$ to members of the public, but it's not regulated.



Examples - 4

Radon indoors

Radon at work and at home are handled by the Work Environment Act, the Planning and Building Act and by the Health and Healthcare Act .

Radon in water is handled by the Swedish Food Act.



Examples - 5

Historical Waste

Wastes of burned alumshale, phosphogypsum, slag and residues from mining and alumbased lightweight concrete are not regulated as of yet. But advice is given not to use it for building construction.



Dose constraints and optimisation

We are currently discussing dose constraints, 1 mSv/a, 0.3 mSv/a, 0.1 mSv/a or 0.01 mSv/a to the general public from NORM.

For handling of tree fuel ashes contaminated by caesium-137 from large energy producers we chose 0.01 mSv/a for each exposure pathway. There are several possible.



Dose constraints

For handling of peat fuel or peat fuel ashes contaminated by caesium-137 0.01 mSv/a will probably apply.

For naturally occurring radionuclides it could be 0.01 mSv/a or 0.1 mSv/a for each exposure pathway or 0.1 mSv/a or 0.3 mSv/a for the sum of all. Strictly according to the Environmental Objective it should be 0.01 mSv/a.



For comparison: Regulation of Handling of tree fuel ash

The objectives of the regulation are to reduce the exposure of the general public from contaminated ashes and to reduce the spread of activity to less contaminated areas.

The constraint value for every exposure pathway is $10 \mu\text{Sv/a}$.

Ashes are considered to be contaminated if the ^{137}Cs -contents exceeds 0.5 kBq/kg .

Any suggestions or comments, now or later, are welcome if this could be applied to peat ashes.



Vielen Dank für Ihren
Aufmerksamkeit
Merci pour votre attention
Grazie per la vostra attenzione
Thank you for your attention



Regulation: Handling of tree fuel ash

Contaminated ashes containing more than 10 kBq/kg should be deposited on a landfill.

Contaminated ashes containing less than 10 kBq/kg can be used as filling materials outdoor and be recycled on forestslands, but may not be spread on arable land or on lichen-land, where reindeer grazes.



Regulation: Handling of tree fuel ash

When contaminated ashes are used as filling material or deposited on a landfill, the environment should be protected against leaching of ^{137}Cs .

The protection is sufficient if the concentration is less than 1.0 Bq/l in a drinking well and the contents of the leachate divided by the dilution in a recipient is less than 0.1 Bq/l.

