NORM – Regulatory context in Norway

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Norwegian Radiation Protection Authority (NRPA)

EU COMET course:

"COURSE ON NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM) IN THE ENVIRONMENT"

Radioactive waste - basic definitions

Regulations on the application of the Pollution Control Act to radioactive pollution and radioactive waste

- (a) ***radioactive substance*** means any substance that emits alpha, beta or gamma radiation,
- (b) ***radioactive pollution*** means radiation from radioactive substances which cause or may cause damage or nuisance to the environment. This includes also radiation from naturally occurring radioactive substances where human activity leads to increased exposure of humans or the environment to radiation,
- (c) ***radioactive waste*** means objects of personal property or substances that are considered to be waste under the Pollution Control Act section 27 first paragraph and contain or are contaminated with radioactive substances with specific activity that exceeds or are equal to values listed in annex I letter a,
- (d) ***radioactive waste subject to a disposal*** *requirement* means radioactive waste with values that exceeds or are equal to values for total activity and specific activity listed in annex I letter b.

Norwegian Radiation Protection Authority (NRPA)

Statens strålevern
Norwegian Radiation Protection Authority

- Overseeing the use of radioactive substances and fissile material
- Coordinating contingency plans against nuclear accidents and radioactive fallout
- Monitoring natural and artificial radiation in the environment and at the workplace
- Increasing the knowledge of the occurrence, risk and effects of radiation

- Bilateral and multilateral cooperation with other countries and international organizations for radiation protection and nuclear safety

The long and winding road to the new legislation

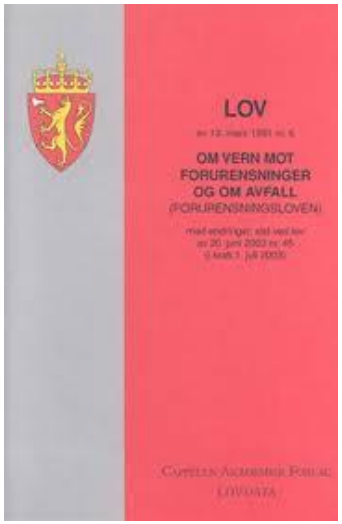
Norwegian legislation for Radiation Protection has been revised and new legislation was put into force on the **1st of January 2011**

Now:

- The Pollution Control Act
- Regulations on the application of the Pollution Control Act
  to radioactive pollution and radioactive waste
  (the regulation of radioactive pollution and radioactive waste)
- Regulations relating to the recycling of waste
  (Waste regulations)

Before:

- Act on Radiation Protection and Use of Radiation
- Regulation relating to Radiation Protection and
  Use of Radiation



Holistic approach to protection of the human health and environment

- Background:

  Radioactive waste and pollution have similar characteristics as for instance environmental poisons and hazardous waste

- Main achievement:
  - **Holistic ecosystem based approach to regulation of waste management and pollution**

- How to achieve that:

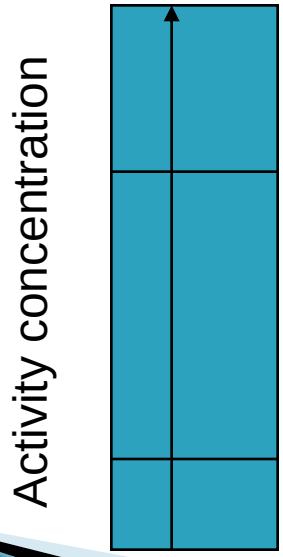
  Gather the regulation of waste management and pollution under one Act

Ecosystem based regulatory approach

- The new regulation implies that radioactive materials (discharges and waste) are regulated under the same legislation as contaminant discharges and hazardous waste
- The Pollution Control Act applies to all industries since the protection of the humans and environment should be the same regardless of the source
- Consider whole ecosystem and all potential pollutants / stressors in it
- Regulatory important decisions made on basis of complementary and consistent ecosystem knowledge – environmental chemistry, ecology, radioecology, radiobiology etc.

Radioactive Waste – tiered approach

- Values for when **waste is regulated as radioactive**
  - Based on IAEA RS-G-1.7 (and partly draft IAEA BSS 24th February 2010 and RP 122 part II), **NORM - 1 Bq/g**
- Values for when **the waste has to be sent to a repository**
  - Based on IAEA BSS, E.g. Ra-226, Ra-228 and Pb-210 **10 Bq/g**
- Three tiers approach



Waste has to be **sent to a repository**

• Waste which is **also classified as hazardous** can be **sent for disposal with license for hazardous or radioactive waste**
• Waste which is **only radioactive** can be sent **for disposal with a license from NRPA**

Waste is **not regulated as radioactive**

Radioactive waste - requirements

- Requirements in the new legislation are very

  similar to requirements for hazardous waste

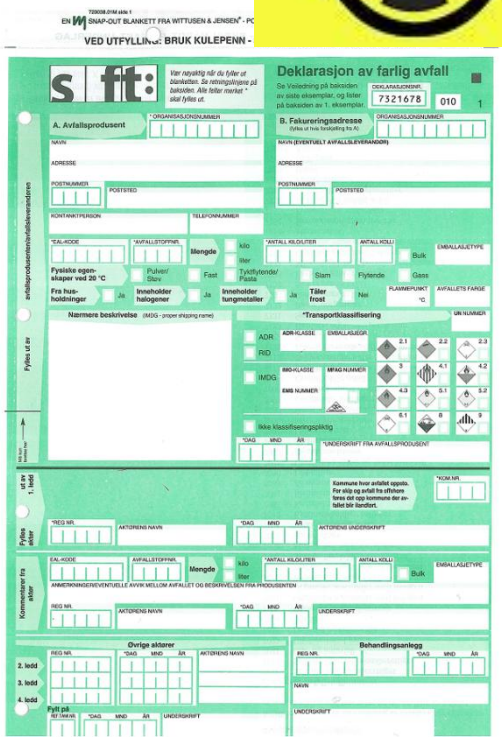
  - Duty to declare and a duty to deliver radioactive waste to authorised companies at least once a year
  - License requirement for companies who manage radioactive waste and a yearly report to NRPA
  - Requirement of justifiable waste management

- NORM waste is often also classified as hazardous waste

  heavy metals, organics, etc.

Radioactive waste - declaration

- Radioactive waste has to be declared
  - Same form as for hazardous waste, both radioactive and other characteristics
  - Easier for the industry and better overall information to the authorities
- European waste list for hazardous waste + Norwegian waste category number
  - Specify what is hazardous and radioactive waste
  - Specify what is radioactive waste
- From 2015 declaration of waste is done online



Legal requirements - summarized

- Permit requirement for activity which leads or may lead to radioactive pollution
- Requirement of proper handling of radioactive waste
- Duty to declare radioactive waste
- Duty to deliver radioactive waste to authorized companies at least once per year
- Duty to report annually facts on radioactive waste to the authorities
- Duty to have proper competence and knowledge

Radioactive waste management - NORM stream example

- Waste management companies
- Cleans contaminated equipments

WERGELAND - HALSVIK AS

NOAH
KOMPETANSE TIL Å OVERTA ANSVAR

Repositories for radioactive waste

Outputs of the 'new' legislation

- Industry, institutes, hospitals etc.
  - One legislation regulating all kinds of pollution and waste in Norway
  - More harmonised regulation from NRPA and the Norwegian Environment Agency
  - Regulation is (hopefully) more clear – positive feedback from industry and companies

- Authorities
  - More cooperation between NRPA and the Norwegian Environment Agency and learn from each other e.g. joint reporting, joint audits etc
  - Information on the radioactive as well as other characteristics of the waste and pollution to both agencies
  - Better and overall legislation to regulate radioactive waste and pollution

Some results - numbers and facts

- NRPA has issued 165 permits in time period 2011 – 2014 to about 70 companies (waste included artificial and NORM)
- Number of declarations of radioactive waste summarized for 2011–2013 was 941with 90.868 tonnes of radioactive waste

Table 1. Declaration of radioactive waste

Year	Number of declarations	Radioactive waste (tonnes)
2011	310	17730
2012	279	41538
2013	352	31600

Alum shale – source of *radioactive NORM waste* and pollution (ongoing work)

- Large quantities of alum shales in Norwegian Counties Akershus, Oslo, Oppland, Buskerud og Hedmark
- Variable ^{238}U concentration in alum shales
  - High ^{238}U leads to high ^{222}Rn air levels – indoor radon problems
  - Oxidation, acidic leachate and mobilization of ^{238}U chain radionuclides

Alum shale deposited in nature – without permit (source: NRPA)

Alum shale – source of radioactive waste and pollution (ongoing work) cont'd

- ***Alum shale - a potential hazard during construction of the roads, tunnels or other exploitation in Norway***

- Legal requirements for handling of alum shale radioactive waste

  - screening for ^{238}U levels in rocks (if > 1 Bq/g radioactive waste)
  - permit from NRPA for radioactive pollution release if it is actual when alum shale rocks are excavated
  - safe handling of alum shale rock masses
  - disposal of excavated masses to disposal facilities with proper license
  - declaration of radioactive waste

Alum shale – source of radioactive waste and pollution (ongoing work) cont'd

- Integrated regulatory approach
- Intensive collaboration between authorities to:

  - provide one joint guidance on how to characterize alum shale and potential hazards

  - find best solution for some historical cases of improper alum shale deposition in nature

  - jointly advice companies and in a way facilitate building of new disposal sites for alum shale waste whose volume scale is expected to increase in future

  - organize joint inspections in efficient way (both for authorities and industry)

Closing remark

- A hollistic approach to radioactive waste and hazardous waste means the rational use of resources and application of national policies and standards
- Further improvement should be directed to development of interfaces between procedures for radioactive and hazardous waste, optimization of assessment approaches and where possible harmonization of these at international levels