

# International Experience and Challenges to Regulatory Supervision of Legacy Sites

**Malgorzata K Sneve**  
Norwegian Radiation Protection Authority

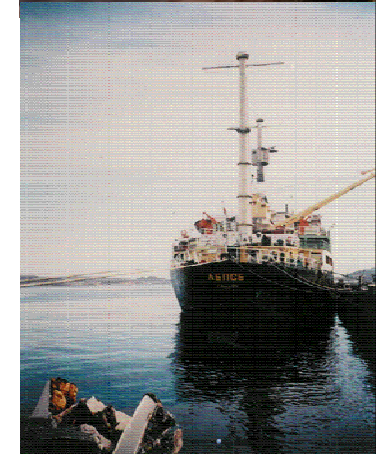
EMRAS II Norm and Legacy Sites Working Group  
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# Nuclear Legacy Management

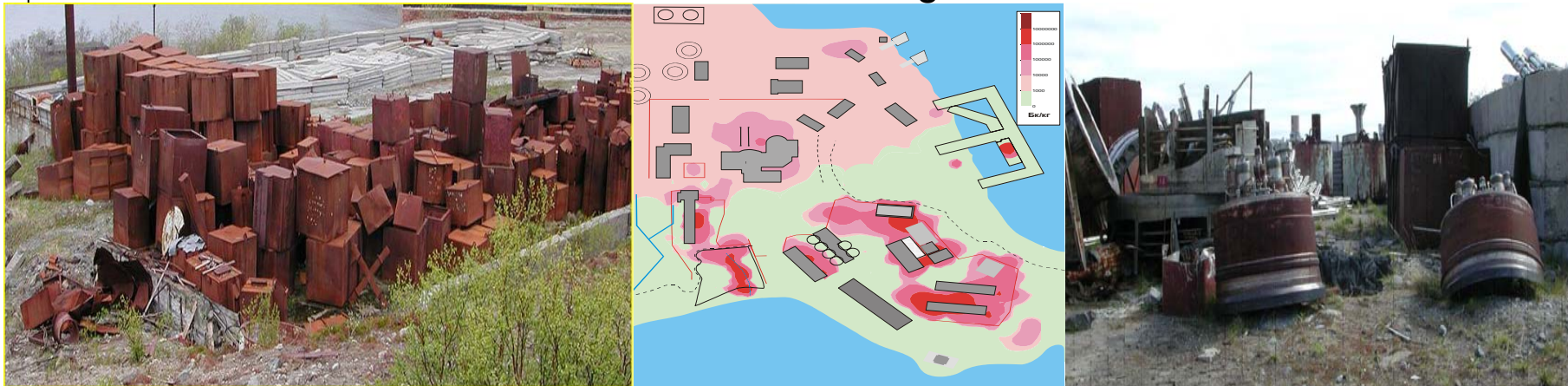
## Norwegian Policy and Role of NRPA

- Nuclear Legacy Management is a global issue being addressed through international cooperation
- It requires a responsible approach to environmental and human health protection, avoiding short term measures which create new legacies
- Significant part of legacy management is radiation protection and nuclear safety
- Strong independent regulatory supervision is crucial to delivery of safety and confidence in the whole process
- Collaboration needs to include a proportionate level of support to regulators, not just operators
- NRPA has a substantial and successful regulatory support programme with Russian Authorities, focussing on NW Russia



# Role of International Guidance and Recommendations

- IAEA Safety Fundamentals and Basic Safety Standards provides the over-arching basis for safety and radiation protection supervision
- More specific IAEA documents provide guidance on how to address particular topics
- These documents need interpretation at the national level, so as to take account of:
  - national regulatory frameworks, details of technology application, and geophysical factors,
  - as well as social, cultural and resourcing matters



# Environmental Nuclear Legacy and Regulatory Challenges



# Mechanisms for Improved Regulatory Supervision

- **Threat assessments** to identify priorities - what are the key regulatory weaknesses in relation to the most hazardous legacies?
- **Creating improved and new regulatory requirements and guidance** - so that the operator knows what he has to achieve and the regulators have effective and efficient mechanisms for supervision
- **Site characterisation** - to better understand the ecology of the sites, what the contamination is, and how it behaves in those site environments, giving rise to environmental and human health impacts
- **Prospective radiological and environmental impact assessments** - methodology development and site specific application based on site and contamination characteristics. The results are used to support justification of proposals for how to achieve compliance with requirements, or, if regulator, to confirm that the operator proposals will meet requirements
- **Risk management assessments** - to have a wider context than just environmental and human health assessments; they support choices among options for remediation and support evaluation of optimisation
- **Public confidence** - providing stakeholders with relevant information and opportunities to provide inputs
- **Risk Management** - choosing among options



# Use of Initial Threat Assessments

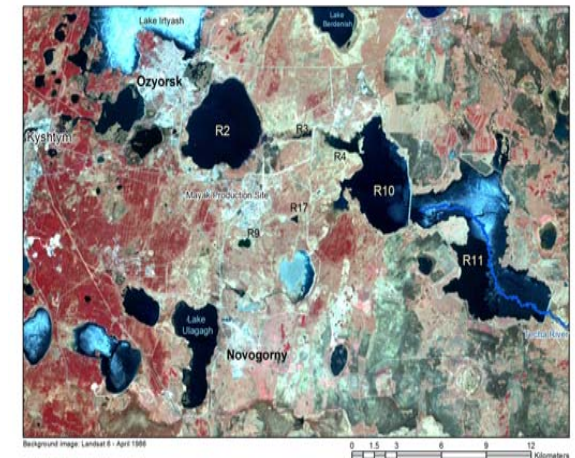
## Example results from SevRAO sites in NW Russia

- Badly stored damaged spent nuclear fuel, as well as leaking liquid solid radioactive waste stores
- Dose rates in some areas exceed 1 mSv/h
- The territory contaminated by Sr-90, Cs-137 and Co-60, with the highest values up to 1E6 Bq/kg
- Cs-137 in bottom sediments of the coastal strip up to 600 Bq/kg
- Cs-137 in stream water up to 500 Bq/l near Building 5
- Situation is outside normal regulatory scheme so new regulations are needed
- Decisions on managing the residual contaminated areas once spent fuel is removed depend on prospective assessments of future contaminant behaviour
- The threat assessments tell us what regulatory development is needed and which assessments are necessary to support decisions

# NRPA Regulatory Cooperation Experience

- The NRPA has enjoyed a long-standing and positive experience developing regulatory cooperation with Russian Federation authorities
- Logistically convenient to apply the good experience in Russia to neighbouring countries, where there are some institutional and geographical similarities with Russia. This is just now starting with Central Asia, with the focus on uranium mining and milling legacy facilities.

*But* - the technical details of the legacies are not exactly the same: legal, cultural and social, as well as geographical and waste type differences



## More than Just Meeting Dose Limits

- Dose constraints and radiological optimisation are dependent on local situations
- Radiation and radioactive materials are important, but there are other pernicious pollutants and environmental issues to consider
- Limited financial and other resources to manage the legacy, influence of social, cultural and other factors
- Strong and clear system of norms, standards and related regulatory process provides basis for environmental, health and safety management

*BUT* must be flexible enough

- to allow for local and regional factors,
- effective interface with wider decision making process, for example: non-radiological risks, wider national environmental policy, wider national waste management policy, and cross-border issues



# General Objectives of the International Regulatory Cooperation

Efficient and effective regulatory supervision of nuclear legacy projects, to protect western investments in nuclear legacy management.

Integrated coverage of nuclear and radiation safety, comprising:

- worker and public safety;
- environmental and human health protection and monitoring;
- normal and accident conditions;
- emergency preparedness and response;
- addressing high risk issues arising from nuclear legacies,

*but, at the same time,*

- addressing longer term management, site remediation and waste storage and disposal, so as not to prejudice safety in the future

## What does NRPA hope to achieve in EMRAS II NORM and Legacy Site WG?

- Help to develop international guidance on the management of NORM and legacy sites
- Help to develop examples of application of that guidance
- Base those examples on real sites and real legacy management problems, so as to be of practical interim use as well as provide the guidance and examples for the future. NRPA and its bi-lateral partners are ready to provide these within EMRAS II.



## What does NRPA hope to achieve in EMRAS II NORM and Legacy Site WG?

Ensure that the guidance and examples are:

- consistent with IAEA Safety Fundamentals and Basic Safety Standards, which clearly apply to all legacies
- illustrate how the assessment methods and technical approaches need to be different, to allow for different situations
- support the development of updated national Norms and Regulations and regulatory guidance which account for international requirements and recommendations, as well as other relevant national good practice
- support development of effective and efficient regulatory procedures for licensing and compliance monitoring
- promote the sharing of relevant science and technology, as well as regulatory experience in all the above

# International Working Forum for Regulatory Supervision of Legacy Sites

*This Forum was approved at the General Conference last week with objective:*

***To promote high standards of regulatory supervision for the management of legacy sites, in line with the IAEA Safety Standards and good international practices***

*To be achieved through:*

- collection and collation of information on nuclear legacy sites, the historical experience of legacy supervision;
- exchange of information on nuclear legacy site restoration plans, and the role of regulatory supervision in planning activities;
- the generation of mutual support through presentation and discussion on how regulatory supervision can be made effective and efficient

*NRPA sees EMRAS as feeding information and methods into the RSLS Forum as well as receiving support from it.*

## Working Programme Ideas

- Testing the application of the draft General Model Development Process (GMDP) at sites of interest, to improve the GMDP and guide its further development
- Consider different types of site and wastes in the same country, and the same types of sites and wastes in different countries so as to differentiate how the methods need to be different according different features of the problem
- Models developed for NORM sites can be applicable for the nuclear legacy sites after additional extension
- Development of the regulatory guidance documents for management and remediation of NORM and legacy sites



# Working Programme

## Provisional tasks:

- Compare assessment methods for different areas (see below) - to allow for sharing of technical experience
- Testing their fitness for purpose to address IAEA safety requirements, and by implication, their suitability for compliance demonstration
- Provide information on the nature of waste and site characterisation data necessary to support the assessments
- Provide feedback into IAEA regulatory programmes.

# Working Programme

## Provisional assessment areas:

- Operational releases during remediation (models to help decide how much can be released)
- Contaminated land management (changes in radioecological conditions, optimisation, how much residual activity is safe)
- Waste disposal on site (how much can be disposed according to facility design, near surface facilities, VLLW etc.)
- Consequences of potential incidents that can be anticipated during remedial operations



# Working Programme

- **Case studies for nuclear legacy:**
  - Case studies in Estonia and Belgium
  - Nuclear legacy sites in Russia
  - Uranium legacy in Central Asian countries
  - Other?