



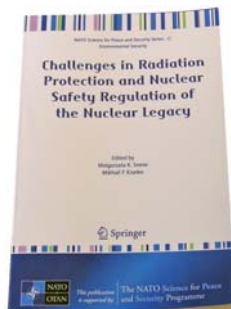
## Cooperation with Russian Regulatory Authorities: NATO Book and Workshop in Bergen in 2008



*Workshop “Application of Radioecology to Regulation of Nuclear Legacy Management”,  
Bergen, Norway, 14 – 15 June 2008*

**“Challenges in Radiation Protection and Nuclear Safety Regulation of the Nuclear Legacy” ISBN 978-1-4020-8633-5 (PB). ISBN 978-1-4020-8632-8 (HB). ISBN 978-1-4020-8634-2 (e-book)**

The book “Challenges in Radiation Protection and Nuclear Safety Regulation of the Nuclear Legacy” was published by Springer in cooperation with the NATO Public Diplomacy Division in August 2008 following an Advanced Research Workshop of the same title. The workshop was organised jointly by the Norwegian



Radiation Protection Authority (NRPA) and the Federal Medical-Biological Agency of Russia (FMBA) and held at “Ershovo” (Zvenigorod) in Moscow, Russia, 25-27 September 2007. Local arrangements were organised by the FMBA and the Burnysian Federal Medical-Biological Centre (FMBC).

The workshop was sponsored by the NATO Programme “Security through Science” and the NRPA. The sponsorship and the financial support of NATO are gratefully acknowledged. There were over 60 participants from 8 countries as well as representatives from the International Commission on Radiological Protection, the International

Atomic Energy Agency and NATO. The organisations involved included regulatory authorities, operators and technical support organizations. This wide level of participation reflects the importance placed upon international cooperation on nuclear legacy management issues.

Presentations made were divided into four areas:

Session I: Nuclear Legacy Challenges

Session II: Regulatory Implementation of Treaties, Standards and Recommendations

Session III: Challenges in Practical Implementation of Remediation Strategy in Russia and Abroad

Session IV: Safety Regulation Experience in Russia and Abroad

Following strong discussion, the following recommendations were drawn.

The Russian Federation has responsibility to manage its own nuclear legacy. But it is also one of several countries in the global network of nuclear activities. Harmonisation of approaches is valuable in building future cooperation, but local conditions may influence the best local solution. Accordingly, future exchanges, such as those provided for by this workshop, should be encouraged.

Development of a broader and deeper safety culture should be a long term objective, while at the same time maintaining the highest standards of radiation protection and nuclear safety as possible.

There are many complex issues to be addressed and they cannot all be solved at once. Clear recognition of the major threats, as well as weakness in regulatory processes, can be useful in directing future resources. However, at this stage it is clear that there are specific regulatory issues to address with respect to regulatory requirements and guidance for nuclear legacy sites concerning:

- site remediation,
- waste forms for long term storage and disposal, and
- disposal facilities.

In turn, such work is dependent on better characterisation of radioactive waste as well as site characterisation information.

Such guidance needs to be thoroughly based on the best use of scientific and technical information. At the same time, part of the solution relates to policy issues and value judgements, and so broader interaction among regulators, operators and other stakeholders is to be encouraged.

### **Workshop “Application of Radioecology to Regulation of Nuclear Legacy Management”, Bergen, Norway, 14 – 15 June 2008**



The “International Conference on Radioecology & Environmental Radioactivity” was held from 15–20, June 2008 in Bergen, Norway.

In conjunction with the Conference, a workshop entitled: “Application of Radioecology to Regulation of Nuclear Legacy Management” was held during 14 – 15 June 2008. Representatives of regulatory authorities and technical support organisations from 6 countries took part.

This workshop was intended to promote cooperation among regulatory authorities and their technical support organisations, and to investigate the challenges in the application of good science within the regulatory process for nuclear legacy management.

Regulatory cooperation is a major part of the Norwegian Government’s Plan of Action to improve nuclear and radiation safety in NW Russian. For operational safety, and day to day site management, radiation monitoring can be used directly to confirm compliance with standards. By contrast, for long-term legacy management, we have to rely on

an understanding of the site combined with 'assessment models'. Together, these allow us to make prospective assessments of alternative options for site management, or to plan responses to possible future accidents. There are many difficulties relating to interpretation of radio-ecological data within the context of specific eco-systems, and how they are coupled with engineered features of sites and facilities.

The NRPA has had considerable experience working with Russian colleagues at sites in North West Russia and we have made good progress, as illustrated by work on



Andreeva Bay and Gremikha (NRPA Reports 2007:11 and 2008:7) and on RTGs (NRPA Report 2007:5). However we can also see some problems on the horizon.

Questions raised at the workshop included:

- How do we interpret the measurements for use in the assessments, taking account of the uncertainties?
- Can we learn from the waste repository community, which has been studying the longer term for many years?
- Can we develop a common and documented understanding of the priority issues which deserve further attention to resolve uncertainties?
- Can we do more to share existing information?
- Should there be a wider regulator's forum on nuclear legacy management?

## Conclusions and Recommendations

There was a wide range of presentations made at the workshop, offering different perspectives from different countries. These prompted substantial

discussion and the following points of consensus emerged.

- Regulatory decisions should be supported by science. However, there are significant uncertainties in scientific information relating to management of emergencies, routine present day situations and long-term site management and waste disposal, all of which are relevant to nuclear legacy management.
- These uncertainties relate to different radionuclides and on different temporal and spatial scales. There is no single solution, but a broad range of scientific and other factors to address.
- Problems associated with large possible impacts, which affect the progress of strategic plans and which absorb large resources are clearly more important than those which do not.

It was recommended that regulators should:

- Maintain an understanding of the operational strategy;
- Make Regulatory Threat Assessments to support developments within that strategy;
- Maintain regulatory development to provide:
  - adequate and relevant norms and guidance,
  - an efficient regulatory review process, and
  - compliance monitoring;
- Maintain an independent Environmental Impact and Risk Assessment capability; and
- Be aware of the weaknesses in those assessments and include uncertainty estimates.

Uncertainties can be managed most efficiently through a tiered approach to assessments, as follows:

**Tier 1.** This involves simple models with limited data requirements and robust, conservative assumptions. This is not resource intensive. If the results suggest that the impacts meet regulator and other



requirements, then this is a sufficient level of assessment.

**Tier 2.** If Tier 1 assessment raises some concerns, then closer inspection of the local situation like source, pathway, recipient etc., may be called for. More data is required to support more detailed, process orientated dynamic models.

**Tier 3.** After Tier 2 there are still concerns, then site specific measurements and experiments to support the third Tier of assessments may be necessary, including, where appropriate, development of new models. The specific research needs will be identified by an uncertainty analysis component of the Tier 2 assessments.

This approach, combined with Threat Assessments, helps to ensure that the research resources are applied to problems which impact most heavily on people and the environment.

Specifically challenging issues identified included:

**Responsibility:** Regulatory bodies should contribute to their national strategy for legacy management and take account of all the steps in the wider radioactive waste management strategy. Regulations and regulatory responsibility must be clear to remove uncertainties in the process of supervision.

**Knowledge Management:** We should learn from past events, and maintain records not just for immediate events management but also for the future, and make use of the memory of senior or retired staff.

**Uncertainties:** Knowledge of important uncertainties comes from properly implemented safety assessments. If these assessments have not been done, this becomes the first priority.

**Training:** We should provide training courses for younger persons to develop the necessary skills. Competence levels in radio-ecology and other assessment skills need to match needs for managing the legacy, but also to support new

developments in nuclear power and other uses of radioactive material.

**Regulatory Functions:** We should improve the integration of different regulatory branches, to support application of the optimization principle and achieve a balanced approach.

**Data Resources and Management:** We should:

- make data acquisition and interpretation an integral part of environmental impact and risk assessments; and
- make wider use of data resources at the IAEA and other organisations, such as the International Union of Radioecology, and provide our own experiences and inputs to such international initiatives.

**Coordinated Research:** Some of the challenges are very fundamental and very complex, e.g. multi-stressors. To resolve such problems, there is a need for combined funding systems and sufficient resources to produce core competence.

**Communication:** Better communication strategies are needed to explain international recommendations, the national policy in each country, the strategy to deliver the policy, what the safety standards mean and how regulatory supervision is applied to ensure the standards are met. Risks and uncertainties identified by the assessment process need to be better communicated to risk managers and other non-specialist stakeholders.

**Sharing Experience:** There is a need for improved mechanisms for sharing experience on data acquisition, site generic data, assessment methods, regulatory processes such as licensing and compliance monitoring, communication etc. for legacy site management. Exchange of information among research groups and with regulators is to be encouraged.

