

## Cooperation between Norwegian and Russian Regulatory Authorities with Focus on Andreyev Bay and Gremikha

### Regulation of Radioactive Waste Management and Remediation of Contaminated Land

The strategy within the Norwegian Action Plan for Nuclear Safety includes cooperation with Russian regulatory bodies, to ensure that remediation work is carried out in compliance with Russian Federation law, taking into account international recommendations and good practices in other countries. The Norwegian Radiation Protection Authority (NRPA) has set up a programme of cooperation with the Federal Medical-Biological Agency (FMBA), which is responsible for radiation protection regulation at Andreyev Bay and Gremikha. The overall objective of the work is to promote effective and efficient regulatory supervision of activities at Andreyev Bay and Gremikha.

Spent nuclear fuel and radioactive waste are stored at technical bases operated by the Federal Enterprise SevRAO at Andreyev Bay and Gremikha on the Kola Peninsula in Northwest Russia. The storage conditions are poor, and the handling of these significant inventories of dangerous materials is especially hazardous because of their degraded state. Furthermore, significant quantities of radio nuclides have already leaked into the ground around the storage facilities. The potential for

spreading of this contamination and for further releases creates additional hazards, both locally and on a regional scale. An enhanced regulatory process is required to support actions to improve the radiological conditions because of the unusual and non-standard circumstances at the sites.

### Summary of Efforts

As in many other countries, there are different regulations applicable to civilian and military sites in Russia. The practical remediation of a large site, such as Andreyev Bay, can be challenging, given the overlap of management issues, including site remediation, waste characterisation, treatment, transport, storage, and disposal of waste.

Objectives within the project (Regulatory Support Project) are to:

- describe the nature of the source term and problem;
- determine the current Russian Federation regulatory basis;



Overview of Building nr. 5 at Andreyev Bay.

- review international recommendations and other national good practices;
- identify what is needed in addition, if anything, within Russian Federation regulations;
- identify what is needed to improve regulatory process including nature and content of safety cases;
- support the regulatory review of licence applications, e.g. via technical advice from technical support organisations from Russian institutions and elsewhere;
- support on-going supervision and monitoring of compliance with licence conditions.

### Objectives and Scope

The overall objective of this work is to promote effective and efficient regulatory supervision of SevRAO activities at Andreyev Bay and Gremikha within the scope of the responsibilities of the FMBA. The cooperation is being implemented through three specific projects addressing:

- radiation protection of workers on the sites, particularly in relation to planned operations to improve the storage of spent nuclear fuel and radioactive waste and/or remove it from the sites;
- radiation protection of the public, during decommissioning operations on the site and in the long-term, following rehabilitation of the sites; and
- arrangements for emergency response, particularly medical response to worker overexposure incidents that could occur during spent nuclear fuel management operations.

### Initial Threat Assessment Report

An early step in each of the three projects has been to assess, from a regulatory perspective, the radiological threats currently existing and those

that could occur through the work which is to be carried out at the bases. Basic Russian laws on use of radioactive materials and radiation protection provide a full basis for normal operations. However, given the special conditions on the bases in Andreyev and Gremikha, a combined initial threat assessment was prepared in order to identify:

- the main radiological threats to workers and the public which require regulatory attention;
- the main requirements for risk assessment, i.e. those issues which will require most urgent and/or detailed analysis;
- any relevant additional regulatory requirements, and the nature of the safety work instructions to be developed by the operator; and
- key issues in the implementation of the regulatory process.



*Measurements close to storage of radioactive waste at Andreyev Bay.*

### Project 1: Regulatory Supervision of Radiation Exposures of Workers

This project has the primary objective to develop criteria and regulatory guidance to improve the radiological conditions of personnel working at SevRAO facilities, focusing on Andreyev Bay. Tasks and related deliverables include development of:

- guidance on hygienic norms for exposure doses to personnel in routine, abnormal and emergency/remediation situations in the

management of spent nuclear fuel and radioactive waste, taking into account both existing generic requirements and site specific working and radiation conditions at Andreyev Bay.

- guidance on the application of means of protection of personnel at SevRAO facilities.
- final guidance “Sanitary rules of radiation safety for work at SevRAO facilities” based on output from the above tasks and analyses of experience in management of spent nuclear fuel and radioactive waste.



*Water sampling close to Andreyev Bay.*

### **Project 2: Regulatory Supervision of Radiation Exposures of the Public**

This project has the primary objective to develop norms and standards and supporting regulatory guidance for application during and upon completion of rehabilitation of Andreyev Bay and Gremikha. Tasks and related deliverables include:

- reports on: “Methods for conducting radiological assessment during rehabilitation activities”; and “Methods for organisation of radiation control”.
- development of radiation criteria and norms providing socially accepted guarantees of public radiation safety during and after rehabilitation of the sites.

### **Project 3. Regulatory Supervision of Emergency Preparedness for Response**

This project has the primary objective to provide regulatory guidance on the planning of radiological and medical emergencies management at SevRAO facilities, focusing on Andreyev Bay. Tasks and related deliverables include development of:

- transparent explanation of organisational responsibilities with regards to emergency preparedness, operators and regulators.
- regulatory basis for requirements for emergency preparedness.
- guidance on medical and sanitary planning for emergency situations.
- training in medical emergency preparedness for radiation emergencies.



*Air measurements close to Building 5 at Andreyev Bay.*

### **Implications for the future**

Implementation of regulations to non-standard situations is not easy, especially when many organisations are involved and different technologies are applied. The work to date has shown the

importance of identifying the responsibilities and role of the different regulatory authorities, their involvement at the early stages of planned projects related to Andreyev Bay, and also their relation to Rosatom and the operator at the site (SevRAO). Co-operation between all parties will improve mutual understanding of the Russian regulatory system.

**Some tasks for possible future cooperation are outlined through the Regulatory Support Project:**

- Evaluation of the risk of emergencies caused by nuclear- and radiation-hazardous objects with estimation of their impact on radiation conditions in the Northwest region.
- Improvement of medical emergency preparedness and response in relation to radiation at the facilities on the Kola Peninsula.
- Enhancement of the normative-legal base in the field of personnel radiation protection.
- Development of methods for improving radiation protection and control of objects presenting a radiation risk to ensure better safety and worker protection.
- Joint cooperation on inspection activities.

In parallel, activities can be prepared for future decision making on the decommissioning and de-licensing of the sites followed by necessary clean-up in the surrounding areas.

The main preparatory activities would aim to:

- obtain better information on the radiological conditions off-site, and how these are changing due to conditions on-site (this information can also be an input to defining the current situation),
- develop regulatory criteria and guidance for the clean-up of contaminated areas and de-licensing of the sites,
- develop regulatory criteria for clearance of wastes as non-radioactive waste, and for long term management of radioactive waste, and
- develop procedures for evaluating whether proposed activities represent the optimised approach, so that radiological impacts are kept as low as reasonably achievable (ALARA), economic and social factors being taken into account.

The conclusions drawn so far are preliminary. Future actions concerning radiological protection supervision will depend on the development and application of broader environmental protection objectives and the corresponding application of environmental impact assessment methods.



*Working meeting within Regulatory Support Project.*



*Study visit of Russian regulators at low and intermediate level waste facility at Himdalen, Norway.*