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Regulatory Support – Russian regulators meet their American counterparts

The Norwegian Radiation Protection Authority (NRPA) and NATO recently funded an information exchange and study visit for Russian experts from the Federal Medical-Biological Agency (FMBA) and the Russian State Research Center – Institute of Biophysics (SRC-IBPh) to meet their counterparts in the United States of America. The aim was to complement the existing NRPA Regulatory Support Projects by providing opportunities for Russian regulatory bodies and their Technical Support Organisations (TSO's) to make working visits to their counterparts overseas, exchange experiences in developing and implementing regulatory processes for a variety of situations. Particular emphasis was placed on site remediation issues of the type faced at Andreeva Bay in North-West Russia.

Meeting with the Nuclear Regulatory Commission.

The visit allowed Russian experts to familiarize themselves with different US regulatory organisations and their distinctive roles in the USA system of radiation and nuclear safety regulation. Site visits also showed the longer term planning of site management programmes and how that they are regulated.

The following organisations were visited:

Department of Energy (DOE). The DOE was created in 1977 as a cabinet level government body. DOE functions include control and monitoring nuclear facilities and sites, including those used in the production of nuclear weapons. DOE is also responsible for the remediation of contaminated sites.

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Nuclear Regulatory Commission (NRC). NRC is the regulator for nuclear and radiation safety at civilian facilities, including nuclear power and non-nuclear uses of radiation;

Environmental Protection Agency (EPA). EPA regulates radiation protection and environmental impacts of all nuclear facilities.

As well as visiting the DOE, NRC and EPA offices in Washington DC, site visits to DOE facilities at Idaho and Handford National Laboratories were organised. These site visits provided an opportunity for the Russian experts to see practical implementation of regulations and meet local regulators, local representatives of the federal bodies and operational managers carrying out remediation activities at the sites.

Idaho National Laboratory (INL) was created in 1949 as the US laboratory for nuclear reactor tests. INL was considered to be the enterprise with the largest number of nuclear reactors in the world: a total of 52 reactors were built. After the end of the "cold war" issues of waste management and land clean-up were prioritized. In 1975, INL became the second largest national location for environmental studies.

Hanford National Laboratory was a major research facility in the Manhattan Project with several production reactors and facilities for managing spent nuclear fuel and radioactive waste. Today, the site illustrates all the problems with old nuclear legacy wastes. Several contractors are involved in different aspects of the remediation activities currently being undertaken on the site.

Historical wastes at Idaho National Laboratories

Meeting with the Department of State.

The Russian experts focused their attention on the following issues:

- The general structure of the US regulation system in relation to radioactive waste management and legacy problems.
- Principal regulatory authorities, the scope of their responsibilities and their implementation.
- The hierarchy of normative and regulatory radiation safety documents.
- Safety standards applied in the USA in the course of remediation operations
- Operator and regulator interaction processes and the separation of responsibilities in the USA

Policy and organizational aspects:

Funding of radiation safety, nuclear facility decommissioning, and land recovery in the USA is defined under long term policies at a national level. Due to the problems faced in recovering old nuclear waste and restoring contaminated areas, new regulations have to be implemented, as in Russia.

The US Congress established the Superfund Program in 1980 to locate, investigate, and clean up the worst sites nationwide. This national law, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) known as "Superfund", led by the EPA focused on:

- Development of an inventory of all contaminated lands;
- Detailed analysis of levels and characterization of contamination, including its migration and hazard areas;
- Clean-up and land recovery programs;
- Development of new methods and technologies relating to site remediation and clean-up.

Deadlines are outlined by the Act and progress and results of land recovery efforts are inspected at these milestones.

Personal protective equipment at Idaho National Laboratory

Discussions about the three party agreements between DOE, EPA and state authorities offered very valuable experience. Special attention was given to the methods of communication with local authorities and residents (including publications, TV broadcastings, community meetings etc.). These provided the opportunity to:

- Provide information on implemented operations and their benefits to local residents and whole country;
- Overcome the negative attitudes of some resident groups to these operations;
- Unify the local authorities, state authorities and residents to get funding for clean-up from the federal budget (from Governor and local congressmen to the federal authorities).

The biggest challenge is the coordination of regulatory bodies in reaching agreements during procedures, including court procedures. All principal challenges are designed to achieve a consensus decision. If this cannot be achieved then the court system is used to resolve disputes.

Visit at the Hanford National Laboratory

Experience in development and application of regulatory documents

Experiences from other countries and international recommendations are only made applicable in the US if positive results are proved for the US situation. The revision of regulatory documents takes a long time (about 10 years) and this process includes several stages, including:

- Elaboration of initial proposals;
- Societal discussion of document draft including hearings, discussions with local bodies and professional organizations, internet counseling etc.;
- Collection and analysis of proposed changes;
- A very important stage is the overcoming the discrepancies between different agencies, state authorities and public non-governmental organizations;
- Approval of the documents by all parties (on the level of specialists). If consensus is not reached, then court procedure is applicable.

Any change of the radiation safety regulations is only possible if it is proved (by the body proposing the change) that this change will lead to radiation safety improvement. Thus, all new proposals including those recommended by international organizations are rejected if they cannot be shown to offer significant positive benefit. The ALARA (As Low As Reasonably Possible) principle is important in the US system and the Russian delegation were interested in

developing a better understanding of how ALARA decisions are reached, to use this experience to support application of regulations in Russia.

US clean-up experiences are relevant to problems in Russia, such as at Mayak P.A., Andreeva Bay and some other facilities. The available US methods for assessing impacts in different situations could be applied in Russia as well, either by using software tools or conceptual models and generic data.

Time for reflection

Practical experience of clean-up, decommissioning and land recovery in USA

The decommissioning of radiation facilities such as research reactors includes:

- Extraction of spent nuclear fuel from the core;
- Positioning SNF in temporary basins or dry storage;
- Disassembling of auxiliary systems;
- Clean-up of buildings and fixation of residual contamination;
- Demolishing the buildings and removal of the debris for disposal (with sorting according to contamination level);
- Isolation of highly radioactive parts of the facility (reactor, steam generator, SNF basin etc.) into a specially constructed storage facility;

Decommissioning personnel involved in the clean-up of a research reactor received doses above 500 mrem (5 mSv) only in a very few cases, whereas the dose limit applied in DOE facilities is 5 rem (50 mSv).

Clear classification and a corresponding system of radioactive waste management is a positive step during decommissioning: the waste is separated according to radiation hazard classes, as follows:

- contaminated soil, debris of demolished buildings are stored in the site surface repository that has adequate shielding; requirements for such repositories are calculated according to population dose criteria for 1000 years;
- low level, short-lived wastes (without transuranics) are packed in metal casks and buried in similar depositories on site.

When implementing new regulatory documents, a transitional period (up to 10 years) is used to implement the specific operational programs.

Meeting with Environmental Protection Agency (EPA)

The Russian-Norwegian visit to the USA was very informative and an opportunity to gather and share knowledge regarding basic regulatory challenges relating to radiation safety. The experience gained will contribute to improvement of the Russian regulatory system and threat reduction in NW Russia.