

Seminar on Waste Treatment and Disposial, Oskarshamn, Sweden, November 9-14, 1998

Malgorzata Karpov Sneve, Jan Oluf Snihs

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Informasjonsutveksling om planer for avfallshåndtering. Russisk strategi angående avfallshåndtering, spesielt angående deponering i Nordvest Russland.

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Information exchange on plans for radioactive waste management. Russian strategy on waste management, specially regarding disposal in North West Russia.

Prosjektleder: Malgorzata Karpow Sneve.

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Statens strålevern, Postboks 55, 1343 Østerås.
Telefon 67 16 25 00, telefax 67 14 74 07.

Statens strålskyddsinstitut
171 16 Stockholm
Tel. 46-8 7297 100 el. 230
Fax 46-8-7297108

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Summary

This report describes a seminar on waste treatment and disposal that was held 9 - 14 November 1998 in Oskarshamn, Sweden. The objective of the seminar was to exchange information on national and international procedures and practices of and requirements on waste management. This information exchange was intended to promote the development of a suitable strategy for management of radioactive waste in Northwest Russia to be used as background for future co-operation in the region.

There were 38 participants, including 19 from Russia and 19 from western countries. Participants came from major operator and regulatory organisations as well as other organisations providing technical support.

The seminar included presentations by Russian and western experts on radioactive waste management in three broad areas:

1. The process of determining the options for final disposal of radioactive waste concerning site and method selection including Environmental Impact Assessment
2. Experiences from performance assessments and safety analyses for repositories intended for low- and intermediate level radioactive waste.
3. Safety of storage and disposal of high-level waste.

In addition, group work and discussions on waste management issues were organised to encourage development of consensus on unresolved issues, notably regarding waste management in Northwest Russia.

The participants also visited the Central Interim Storage Facility for Spent Nuclear Fuel (CLAB), the waste handling facilities at the OKG Nuclear Power Plant and the Äspö Hard Rock Laboratory with exchange of technical information between the hosts at each site and the seminar participants.

The seminar was jointly organised and sponsored by the Swedish Radiation Protection Institute (SSI), the Norwegian Radiation Protection Authority (NRPA), the Nordic Nuclear Safety Research (NKS) and the European Commission. The cooperation and assistance of the management and staff at the OKG Nuclear Power Plant and at the Äspö Hard Rock Laboratory is gratefully acknowledged. The practical organisation of the seminar and site visits was carried out by Studsvik RadWaste AB.

The donors would like to express their sincere thanks to the responsible Management of the CLAB, the OKG Nuclear Power Plant and the Äspö Hard Rock Laboratory respectively for the well organised study visits and shown hospitality. Sincere thanks are also expressed to Studsvik RadWaste AB for its contribution to a successful seminar.

The main conclusions from the seminar were as follows:

- It is the prerogative of the Russian federal government to devise and to implement a waste management strategy, and they could not necessarily be expected to subscribe to any of the working group positions or recommendations made at this meeting.

- Some participants took the view that many of the points raised on strategy and responsibilities have already been covered in existing government documents. The only really important question is that of co-operation; in particular, who is allowed to enter into co-operation agreements and how projects should be identified. It is important for appropriate experts to analyse project proposals for content and potential bottlenecks.
- However, Norway and Sweden pointed out that they would like to see a strategic plan in order to identify how and where to co-operate best. Norway is interested in attracting co-operation with Russia from other (third party) countries. They have no wish to interfere in the internal operations within Russia and welcome the apparent focusing of responsibility with Minatom and look forward to closer co-operation in the future.
- The nuclear safety, radiation protection and supervision authority of Russia, Gosatomnadzor, reinforced the point that there is a rigorous structure of laws in place, based on over-arching environmental laws, and that every waste producer is responsible to its own department, although Minatom co-ordinates all activities in all organisations working with radioactive materials. The current Norway/Russia agreement contains 10 projects, but there is other work going on as well. However, a system is needed to decide how to go forward with projects such as the Novaya Zemlya and Kola repositories, in line with international approaches.
- Regional authorities pointed out the importance of understanding that decommissioning submarines is a long and complicated task, with many needs and possibilities for co-operation, especially concerning planning of protection of workers, measurement and characterisation of radioactive waste, waste conditioning, storage and disposal etc. France, the UK and the US also have unresolved issues concerning reactor compartments in submarines, and their co-operation on this problem is welcome.
- In response to a question on whether there are funds and a desire for continued Norway/Sweden/Russia co-operation, Norway and Sweden confirmed that that was the case. It was also suggested that the Russians should produce concrete guidance on what problems, areas and issues should be given highest priority and be most appropriate for co-operation between the countries.
- The hosts concluded by noting that there was clearly some good co-operation already taking place. However there was scope for further Nordic participation in new projects. Indeed, a new programme on reactor safety in the Kola NPP was just starting up. There was clearly a need to continue discussions on the strategy issue, as there were still many misunderstandings between participants. Also, the issue of responsibilities needs to be a subject of continued information exchange.

These conclusions drawn during the seminar are the sole responsibility of the experts involved in the seminar. The sponsoring organisations and the organisations of the participants are not responsible for how the results from the seminar may be used.

Additional conclusions are drawn by the authors of this report as follows:

- The seminar gave the opportunity to exchange information and views between different parties from Russia and western countries. Especially it was useful to recognise the needs for stronger co-operation and co-ordination between different parties inside and outside the Russian Federation. It was recognised that there are different views on existing strategy on waste management in Russia. In western opinion represented at the seminar, the coherent waste management strategy in Russia is missing.
- There is still some misunderstanding about the meaning and content of a waste management strategy. It should provide a clear plan of waste management activities in accordance with waste management policy of the Russian Federation. Such a plan should include a description of those steps taken in waste management from waste arising to final disposal, a 'cradle to grave' approach. This would explain the key features of interim storage, waste treatment, transport and final disposal. In a wider context, the processes giving rise to waste should also be brought into the scope of waste management strategy, to ensure that appropriate steps are taken to minimise waste arising and so that an appropriate balance is achieved between worker, public and environmental protection and between control of effluents and routine discharges, risks of unplanned releases from operational facilities and long term risks associated with solid waste disposal facilities.
- Although the IAEA provides an appropriate basis for regulatory development in waste management, the guidance provided is not always sufficiently specific for direct application in individual national circumstances. This is true for all countries with major programs giving rise to radioactive waste, not just the Russian Federation. A major example concerns the appropriate content of Environmental Impact Assessments. Also, even though there are international agreements on basic protection standards in principle for post closure radiation safety of repositories, in practice the details of national standards differ, both among themselves and in some respects from the international recommendations of organisations such as the IAEA and ICRP. Agreement on methods for regulatory demonstration of compliance with such standards is even further away.
- It has been said that Minatom has the overall responsibility. However, many companies involved in transport, handling, etc., are said to have responsibility at different stages in the management of waste. The details of who exactly has responsibility at each stage is not clear.
- While it would be helpful to have a Russian waste management strategy for planning of continued Nordic support in the area of waste management, it is concluded that the Russian Federation is not alone in having difficulties in developing a clear radioactive waste policy that also will be accepted and implemented. For example, several countries have spent huge sums of money and manpower on repository studies without achieving public approval for the corresponding stages in repository development. This argues in favour of very careful technical and political planning. This should not be taken as an excuse for not taking action. Given the risks associated with poor interim storage, urgent action is necessary, but that action should be within a clear overall program, not knee-jerk reactions to local problems. A major potential objective, therefore, for continued Nordic support co-operation could be in the development of that clear strategy. While it is recognised that this can be criticised as further procrastination, in fact it is only consistent

with other on-going national efforts, and it is clearly necessary for projects to be supported within such a framework if the resources are not to be dissipated to no real effect.

Table of contents

1. Introduction..... 8

2. Background..... 8

3. Issues of Concern 9

.....

3.1 Plenary Session..... 9

3.2 Strategy..... 10

3.3 10

Responsibilities.....

3.4 Environmental Impact Assessment..... 11

3.5 Co-operation..... 11

4. Discussion..... 12

4.1 Working group I - Regulatory Authorities..... 12

4.2 Working group II - Operators/Industry..... 13

4.3 Working group III - Science..... 14

4.4 Working group IV - Regional/NW Russia..... 15

4.5 General 16

Discussion.....

5. Conclusions..... 17

6. Attachments..... 19

I. List of Participants..... 19

II. Program..... 20

1. Introduction

A seminar on waste treatment and disposal was held in Oskarshamn, Sweden, in November 9-14, 1998. The objective of the seminar was to exchange information on national and international procedures and practices of and requirements on waste management. This information exchange was intended to promote the development of a suitable strategy for management of radioactive waste in Northwest Russia to be used as background for future co-operation in the region. To this end, the seminar focused on:

- overviews of international co-operation in the waste management field and national systems for waste management;
- experiences from treatment of low- and intermediate-level radioactive waste;
- the process of determining the options for final disposal of radioactive waste;
- experiences from performance assessments and safety analyses for repositories intended for low- and intermediate level radioactive waste;
- safety of storage and disposal of high-level waste.

The seminar was jointly organised and sponsored by the Swedish Radiation Protection Institute (SSI), the Norwegian Radiation Protection Authority (NRPA), the Nordic Nuclear Safety Research (NKS) and the European Commission. The practical organisation of the seminar and site visits was carried out by Studsvik RadWaste AB.

There were 38 participants, including 19 from Russia and 19 from western countries. Participants came from major operator and regulatory organisations as well as other organisations providing technical support. See Attachment I for a list.

2. Background

In February 1998 a meeting was held between Nordic nuclear safety and radiation protection authorities which provided the background for this meeting in Oskarshamn.¹ The Nordic countries are strongly involved in a variety of waste management activities in Russia and they see apparent advantages in co-ordinating Nordic efforts and actions in Russia. Co-ordination of Nordic activities will help prevent unnecessary duplication, hold costs down and keep efforts focused. Russia is a large country with many unresolved problems. Nordic co-ordination at various levels reinforces the Nordic contribution on the co-operation with Russia and improves the chances to reach mutual understanding of the problems and how to solve them taking due consideration to both Russian and Nordic interests. The essence of western involvement in Russia is "help for self-help". Despite its problems, Russia has extensive resources and a wealth of its own expertise. The western assistant co-operation should function as a catalyst for the development of a strategy for a Russian radioactive waste

¹ Reference: Strålevern Rapport 1998:6, Nordisk seminar om avfallshåndtering i Nordvest-Russland. Oslo, 17.-18.februar 1998, M.K. Sneve

management program, including the resolution of issues associated with final disposal of wastes.

Novaya Zemlya has been considered as a potential location for radioactive waste disposal possibly including management facilities. For practical purposes, it may be considered uninhabited territory. The psychological significance of this circumstance is likely to make it easier to achieve general political assent from the population of Northwest Russia for a site on Novaya Zemlya than for one on the mainland. However, any facility located in this area will entail transport of radioactive waste through the southern reaches of the Barents Sea for years to come which implies a wide consideration of various environmental protection aspects.

Permafrost is a significant feature of Novaya Zemlya and is a significant source of complexity surrounding a waste disposal facility on Novaya Zemlya. Western know-how concerning construction operations in permafrost is available and could benefit an international assessment of Russian construction plans. This was one of the conclusions from previous meeting in Oslo.

It is important for the Nordic countries to become thoroughly acquainted with Russia's plans in order to provide confidence that Nordic aid is appropriately focused. Accordingly, Nordic countries wish to obtain updated information directly from the Russian authorities responsible for or involved in the planning and construction of radioactive waste management and disposal facilities, particularly those on Novaya Zemlya.

The Nordic countries had earlier agreed that, within the requirements of Russian policy, they could provide advisory assistance in developing the waste management and disposal plans further, and that they could also provide support and co-operation in realisation of the plans. Future Nordic co-operation with Russia on the management and disposal of radioactive waste should be given high priority by the Nordic countries due to the close geographic vicinity to Russia and their concern for own safety. At the same time, there is clear agreement that waste management, including the disposal of radioactive waste, is Russia's own responsibility.

Noting all the above, the Oskarshamn seminar was organised to include presentations by experts from Russia and western countries and discussions on waste management issues and needs in the Northwest region of Russia, as well as technical visits to the Äspö Hard Rock Laboratory and storage facilities at Oskarshamn nuclear power plant. See Attachment II.

3. Issues of concern

Presentations at the seminar reflected many different perspectives and areas of expertise. These represented scientific, technical and political aspects relating to management of radioactive waste, especially storage and disposal facilities. See Attachment III.

The last day of the seminar included working group activities followed by discussion in plenary session. The group activities are described below.

3.1 Plenary Session

The workshop had broken into four groups prior to the plenary session, each being asked to consider four general issues and report back to the meeting:

1. What might an overall **strategy** for waste management in NW Russia need to consist of?
2. What are the **responsibilities** of each of the organisations concerned?
3. What is the role of **Environmental Impact Assessment (EIA)** in the selection of a repository site (with particular reference to the Novaya Zemlya proposals)?
4. How can international **co-operation** be improved?

The four working groups represented different competence and interest depending on background and who they represented:

1. Regulatory authorities;
2. Operators/Industry;
3. Science and technology;
4. North West Russian region.

The objective was to see whether different views and approaches could be identified for four given issues. The findings of each group are presented below, together with comments on the general discussion which followed. The questions were formulated for discussion as presented in 3.2, 3.3, 3.4 and 3.5.

3.2 Strategy

Background

It is well known that there are great problems with radioactive waste and spent fuel in the Russian Federation. There is a Federal Programme on Radioactive Waste and Spent Nuclear Materials Management for 1995-2005. This is a package of independent measures and a number of needs are identified. However the Programme does not fulfil the requirements of a real strategic plan. That is, it does not present a pathway showing how each problem can be addressed and solved in consistence with overall strategic objectives. Russian experts have developed advanced ideas and strategies may exist. However for western experts this collection of ideas is unclear

Question to answer: What are the overall strategy and objectives of waste management?

3.3 Responsibilities

Background

Many decisions and actions have to be taken in the near future in the RF. There are also many different authorities and organisations involved as well as responsible owners of the problems. In many countries the legislation puts the main responsibility with the producer of the waste - a fact that in most cases has been well known and resources have been assigned and competence to handle the waste has been built up. The central and local authorities in Russia have different responsibilities for radiation protection and nuclear safety. The clarification of the responsibilities is important, so that all issues are addressed and duplication is avoided. There may be differences between Russian and western practices in regulatory work, inspections, and assessments of safety. International recommendations may be too general for application to real problems.

- Questions to answer:
- How is the situation today in Russia?
 - What are the problems?
 - How should work be co-ordinated?
 - What are possible solutions?

- Objectives,
- Responsibilities,
- Implementation,
- Co-ordination.

3.4 Environmental Impact Assessment (EIA)

Background

All steps in waste management should be subject to EIA. This is understood in different ways in different countries. The selection of sites and facilities for treatment, storage or disposal of radioactive waste is developed in a series of stages. Each stage includes decisions. These decisions are influenced, among other things, by the EIAs. EIAs should include consideration of safety in terms of environmental and human health protection, social and economical aspects etc., both in the short and long term. Degree of confidence in the results should be evaluated.

The assessment process is expected to be an "open" process for the public.

- Questions to answer:
- How is the situation today in Russia?
 - What are the problems?
 - How should work be co-ordinated?
 - What are possible solutions?

- Objectives,
- Responsibilities,
- Implementation,
- Co-ordination.

3.5 Co-operation

Background

Experts and political decision makers in western countries recognise the problems in Russia. Russian experts have explained the needs and interest, and co-operation and support have been discussed. Accordingly, western countries and organisations have allocated financial, technical and expertise resources to meet some of these needs. From the western side the supporting co-operation is based on western methods, concepts, policies, etc. However, western methods and strategies are not always unambiguous and sometimes different approaches may be taken in different countries. This must be given due consideration also realising the fact that the overall responsibility is Russian. Inside Russia there are many responsible organisations and the western and Russian organisations should all be better co-ordinated. Mechanisms should be introduced to identify responsibilities for effective co-operation.

Questions to answer:

- How is the situation today in Russia?
- What are the problems?
- How should work be co-ordinated?
- What are possible solutions?

- *Objectives,*
- *Responsibilities,*
- *Implementation,*
- *Co-ordination.*

4. Discussion

After the group work, presentations were made of results by all four groups. Summary of the presentations was given as a basis for plenary discussion.

4.1 Working Group I - Regulatory Authorities

Strategy

An (overall) strategy plan should start with an identification and description of the radioactive sources and the practices giving rise to radioactive waste, the present management procedure, local conditions, economical and political constraints and the actual present, future and potential waste problems.

The strategy should then give priorities to the problems on the basis of their real and potential environmental impact and their lack of consistency with international and national requirements and standards.

Finally it should propose a structured action plan based on a chain-analytical discussion on how to solve the problems in technical and economical terms, giving time tables, responsibilities, need of co-operation etc. ending with a proposed plan for management in the future.

Important parts of the plan are also to identify the appropriate safety levels and the need of legislative basis for implementation of safety levels, the demonstration of compliance with them and the need of licensing.

By such a strategy plan it should be possible understand why, how and when the present and future problems with radioactive waste are taken care of and solved.

Responsibilities

Responsibility for norms and for radiation protection lies with Gosatomnadzor. The practical implementation of national guidelines is the responsibility of Minatom. Nuclear weapons and submarines in operation are the responsibility of the Ministry of Defence. A national legal structure exists, with regional responsibilities, but these need clarification. The role of different responsible authorities, federal and regional, in the choice of priorities is not clear. For example, whether it is better to ensure the safety of existing storage facilities as a first priority, or to provide waste disposal facilities as a first priority (or how to provide the correct balance between these objectives).

EIAs

The implementation and role of EIA in the RF is not clear. The federal administrative body is participating in siting issues. Environmental and radiation protection are considered and the State Committee for Environment Protection gives a permit at the design stage.

Gosatomnadzor provides the operating licence. The procedures and regulations are based on IAEA guidelines. Co-operative support from international experts to interpret and apply these guidelines better was considered to be of great interest as well as a co-operation on the formal and practical application of EIA procedures.

Co-operation

A new co-ordinating group in Russia was considered to be an important recommendation. A suggestion was made to set up such a group, comprising:

- international experts;
- federal bodies;
- regulatory bodies;
- nuclear power industry bodies
- Ministry of Defence.

Participation should be based on actual involvement in the process of waste management, not just on ownership of the wastes.

4.2 Working Group II - Operators/Industry

Strategy

The following key points were identified:

- Radioactive waste and spent fuel are federal property and their management is a federal obligation. Radioactive waste should be disposed of safely and spent fuel should be reprocessed. Direct disposal of fuel without reprocessing is forbidden, although it is clear that some types of spent fuel, especially damaged fuel, will inevitably have to go for direct disposal, owing to their characteristics.
- The guideline for the waste management strategy is still the federal plan, 1995-2005.
- A more detailed waste management plan is developed from this guideline, with individual projects and an estimate of their cost and duration.
- Present knowledge of this plan among the western partners is not sufficient to allow its recognition as an integrated plan, resolving all problems.
- Due to lack of funding, realisation of the plan is hindered dramatically. Only 1.5-3% of the yearly budget requests are satisfied.
- As a consequence, all efforts are concentrated on actions to avoid accident situations.
- These actions are fixed in yearly plans and, in 1998, a two year plan for 1999-2000 is to be developed

Responsibilities

There is a clear split of responsibilities between regulatory and controlling authorities, and organisations responsible for waste management in Russia. The new (1998) federal order 517, improved the sharing of responsibilities on waste management sites. Minatom is responsible for co-ordination of waste management and is the main customer for contractors performing individual tasks, although these might relate to wastes and activities of other organisations.

The regulatory and controlling authorities are participating independently in the approval of waste management strategies and plans, as well as in the design and construction of related facilities. A corresponding legal framework has been set up and implementation is ongoing.

EIAs

The group did not comment on this issue.

Co-operation

In the past, several co-operation projects have been initiated and completed at different levels. In most cases, single Russian organisations, or even single individuals, have been the contractors. Not all of these projects produced an optimal output. Some of them did not fit into the available infrastructure; in some cases the necessary infrastructure was not made available by the Russian partners. As a consequence, some of the projects did not support an integrated waste management approach. Minatom, as the responsible authority for waste management strategy, proposes to concentrate co-operation on the priority projects proposed at CEG meetings. However, the value of bilateral co-operation was also appreciated. The international participants highlighted the need for Minatom to ensure that the necessary support, infrastructure, nuclear liabilities and tax issues are available or resolved.

4.3 Working Group III - Science

Strategy

The existing programme is limited in time and is not really strategic. With respect to the Murmansk and Arkhangelsk region, there are serious problems to be solved. Minatom is the organisation responsible for co-ordinating strategy in this area.

Long-term co-operation projects are required to assist with practical solutions, not simply the provision of advice. It is hoped that TACIS is now starting to move in this direction.

Responsibilities

Many organisations are involved in waste management in NW Russia, but the role of the Interdepartmental Commission in licensing between Minatom and the Federal Government is most important. Although Minatom has overall responsibility, all of the other companies involved in transport, handling, etc., assume responsibility at different stages in the management of the wastes.

EIAs

EIAs are compulsory at all stages of a project. Detailed protocols exist for their structure and content. They have to describe the situation both before and after implementation of a project. Options for management can be compared using EIAs, along with other factors, such as cost and waste transport feasibility. There are plans to carry out EIAs for the proposed Kola peninsula and Novaya Zemlya repositories during 1999.

Co-operation

Co-operation is a two way process and Russia has much to offer as well as to receive. The group suggested three topics for possible addition to the list of projects to be considered for international co-operation:

- Where Russia could assist Scandinavia: An investigation of the principle groundwater-rock interaction systematics for basic rocks, such as diorites, at different temperatures and pressures.

- Where Russia would appreciate assistance: Evaluation of rock mass properties for potential repository sites in the Kola peninsula, based on the results of exploratory drilling, geophysical and geochemical studies. (This project has already been developed for EC funding, in collaboration with NGI and DBE, but a decision is awaited).
- Joint assistance project: A petrochemical and geochemical investigation of basic rock (gabbro/diorite) weathering products, in terms of their potential use in the engineered barrier system of a deep repository (e.g. in place of bentonite). The rocks of the Kola Peninsula would be suitable for this project.

Minatom indicated a desire to add these to their list of projects for advancement.

4.4 Working Group IV - Regional \ NW Russia

Strategy

There is no overall approved federal strategy, but a NW Russia strategy exists in two documents:

- Federal Programme for Waste Management (providing general guidance only);
- Creation of an Infrastructure for Radioactive Waste Management in Northwest Russia (not completely adopted yet, although some parts agreed and finalised).

Both local and Minatom representatives were involved in preparing this documentation. When deciding on international co-operation projects, these documents should be used as a basis for identifying important problems and issues.

Responsibilities

The judicial/legal responsibility lies with the companies who generate the wastes. Co-ordination (at the plant director level) is carried out by Minatom, but does not remove the legal responsibility from the generators. Control/supervision of the responsibilities for safety at the working practices level is exercised by federal bodies and, on a case-by-case basis, by regional agencies. Regarding submarines in operation, these are the responsibility of the Ministry of Defence. As soon as they are handed over for decommissioning, they become the responsibility of Minatom (and the company doing the work), and Gosatomnadzor is responsible for approval and supervision of this work.

EIAs

The group did not comment on this issue.

Co-operation

The group felt that the present system for the dismantling of nuclear submarines, with the involvement of Minatom, was effective. In this area, there is an intergovernmental agreement involving the investors, the central co-ordinating bodies (Gosatomnadzor, State Committee for Environment Protection), the Ministry of Economy and Minatom. The waste generators manage the plants and the submarine bases, and the local co-ordinating bodies take part in the licensing procedure with Gosatomnadzor, the State Committee for Environment Protection and the Ministry of Health. However, there is a scope for co-operation on management of radioactive waste, which, again, could most effectively be co-ordinated through Minatom. In this case the structure for collaboration should include two new organisations, 'Concern' (ROSRAO) at a national level, and a regional equivalent (SEVRAO). ROSRAO would liaise directly with Minatom (who would, in turn, liaise with the Investor and with the Ministry of

Economy) at a national level and would link with SEVRAO, who would have direct connections with the waste producers at the regional level.

4.5 General Discussion

There was only limited opportunity for general discussion, and the majority of points made were for clarification purposes.

1. First, it was pointed out by the Russians with reference to the convention on the safety of spent fuel and radioactive waste management that spent fuel is not a waste, unless it is declared as such by the host nation.
2. It was pointed out by Minatom that, at the end of the day, it is the prerogative of the Russian federal government to devise and to implement a waste management strategy, and that they could not necessarily be expected to support anyone in particular of the working group positions or recommendations made at this meeting. Many of the points on strategy and responsibilities were already covered in existing government documents. The only really important question is that of co-operation; in particular, who is allowed to enter into co-operation agreements and how projects should be identified. It is important for appropriate experts to analyse project proposals for content and potential bottlenecks.
3. However, Norway and Sweden pointed out that they would like to see a strategic plan in order to identify how and where to co-operate best. Norway is interested in attracting co-operation with Russia from other (third party) countries. They have no wish to interfere in the internal operations within Russia and welcome the apparent focusing of responsibility to Minatom, looking forward to closer co-operation in the future.
4. The nuclear safety, radiation protection and supervision authority of Russia, Gosatomnadzor, reinforced the point that there is a rigorous structure of laws in place, based on over-arching environmental laws, and that every waste producer is responsible to its own department, although Minatom co-ordinates all activities in all organisations working with radioactive materials.
5. Regional authorities pointed out the importance of understanding that decommissioning submarines is a long and complicated task, with many possibilities for co-operation, especially concerning planning of protection of workers, measurement and characterisation of radioactive waste, waste conditioning, storage and disposal etc. France, the UK and the US also have unresolved issues concerning reactor compartments in submarines, and the co-operation on this problem is welcome. L/ILW repositories are needed to contain these wastes.
6. In response to a question from Russian side on whether there are funds and a desire for continued Norway/Sweden/Russia co-operation, Norway and Sweden confirmed that that was the case. It was also suggested that the Russians should produce concrete guidance on what problems, areas and issues should be given highest priority and be most appropriate for co-operation between the countries.
7. The hosts concluded by noting that there was clearly some good co-operation already taking place. However there was scope for further Nordic participation in new projects. Indeed, a new programme on reactor safety in the Kola NPP was just starting up. There was clearly a need to continue discussions on the strategy issue, as there were still many misunderstandings between participants. Also, the issue of responsibilities needs to be a subject of continued information exchange.

5. Conclusions

Additional conclusions, which the authors draw from the seminar, are as follows.

1. The seminar gave the opportunity to exchange the information and views between different parties from Russia and western countries. Especially it was useful to recognise the needs for stronger co-operation and co-ordination between different parties inside and outside the Russian Federation. It was recognised that there are different views on existing strategy on waste management in Russia. In western opinion represented at the seminar, the coherent waste management strategy in Russia is missing.
2. There is still some misunderstanding about the meaning and content of a waste management strategy. It should provide a clear plan of waste management activities in accordance with waste management policy of the Russian Federation. Such a plan should include a description of those steps taken in waste management from waste arising to final disposal, a 'cradle to grave' approach. This would explain the key features of interim storage, waste treatment, transport and final disposal. In a wider context, the processes giving rise to waste should also be brought into the scope of waste management strategy, to ensure that appropriate steps are taken to minimise waste arising and so that an appropriate balance is achieved between worker, public and environmental protection and between control of effluents and routine discharges, risks of unplanned releases from operational facilities and long term risks associated with solid waste disposal facilities.
3. Although the IAEA provides an appropriate basis for regulatory development in waste management, the guidance provided is not always sufficiently specific for direct application in individual national circumstances. This is true for all countries with major programs giving rise to radioactive waste, not just the Russian Federation. Also, even though there are international agreements on basic protection standards in principle for post closure radiation safety of repositories, in practice the details of national standards differ, both among themselves and in some respects from the international recommendations of organisations such as the IAEA and ICRP. Agreement on methods for regulatory demonstration of compliance with such standards is even further away.
5. It has been said that Minatom has the overall responsibility. However, many companies involved in transport, handling, etc., are said to have responsibility at different stages in the management of the wastes. The details of who exactly has responsibility at each stage is not clear.
6. While it would be helpful to have a Russian waste management strategy for planning of continued Nordic support in this area, it is concluded that the Russian Federation is not alone in having difficulties in developing a clear radioactive waste policy that also can be accepted and implemented. For example, several countries have spent huge sums of money and manpower on repository studies without achieving public approval for the corresponding stages in repository development. This argues in favour of very careful technical and political planning. This should not be taken as an excuse for not taking action. Given the risks associated with poor interim storage, urgent action is necessary, but that action should be within a clear overall program, not knee-jerk reactions to local problems. A major potential objective, therefore, for continued Nordic support co-operation could be in the development of that clear strategy. While it is recognised that this

can be criticised as further procrastination, in fact it is only consistent with other on-going national efforts, and it is clearly necessary for projects to be supported within such a framework if the resources are not to be dissipated to no real effect.

List of participants

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|-----------------------|---|
| 1. Anatomy Tikhankin | Gosatomnadzor, Moscow, Russia |
| 2. Vladislav Bojko | Gosatomnadzor, Moscow, Russia |
| 3. Valentin Markarov | Gosatomnadzor, Moscow, Russia |
| 4. Sergey Novikov | Gosatomnadzor, St. Petersburg, Russia |
| 5. Lidia Zenkina | Gosatomnadzor, St. Petersburg, Russia |
| 6. Alexander Levine | Gosatomnadzor, Scientific and Technology Centre, Moscow, Russia |
| 7. Igor Safonov | Gosatomnadzor, Moscow, Russia |
| 8. Vasily Velichkin | Academy of Science, Moscow, Russia |
| 9. Andrey Borzunov | Ministry of atomic energy, Moscow, Russia |
| 10. Evgeny Kryukov | Ministry of atomic energy, Moscow, Russia |
| 11. Nikolay Lobanov | VNIPIPromtechnology, Moscow, Russia |
| 12. Lev Tchernachenko | Nuclide, Moscow, Russia |
| 13. Nina Choucharina | State Committee for Environmental Protection, Moscow, Russia |
| 14. Nikolay Melnikov | Administration of Murmansk Region, Murmansk, Russia |
| 15. Ludmila Amozova | Administration of Murmansk Region, Murmansk, Russia |
| 16. Yuri Kozlov | Administration of Arkhangelsk Region, Arkhangelsk, Russia |
| 17. Vladimir Nikitin | Administration of Arkhangelsk Region, Arkhangelsk, Russia |
| 18. Sergey Rovny | NPO "Mayak", Tchelabinsk, Russia |
| 19. Graham Smith | QuantiSci, Oxfordshire, UK |
| 20. Neil Chapman | QuantiSci, Leicestershire, UK |
| 21. Jürgen Krone | DBE, Peina, Germany |
| 22. Torbjørn Norendal | Ministry for foreign affairs, Oslo, Norway |
| 23. Malgorzata Sneve | NRPA, Østerås, Norway |
| 24. Line Blytt | NRPA, Østerås, Norway |
| 25. Bredo Møller | NRPA, Svanvik, Norway |
| 26. Gunnar Johansson | SSI, Stockholm, Sweden |
| 27. Jan Olof Snihs | SSI, Stockholm, Sweden |
| 28. Magnus Westerlind | SSI, Stockholm, Sweden |
| 29. Zlatan Delalic | SSI, Stockholm, Sweden |
| 30. Jan Carlsson | SKB, Stockholm, Sweden |
| 31. Tönis Papp | SKB, Stockholm, Sweden |
| 32. Peter Wikberg | SKB, Stockholm, Sweden |
| 33. Fred Karlsson | SKB, Stockholm, Sweden |
| 34. Bertil Grundfelt | Kemakta, Stockholm, Sweden |
| 35. Ulla Bergström | Studsvik EcoSafe, Nyköping, Sweden |
| 36. Karin Brodén | Studsvik RadWaste, Nyköping, Sweden |
| 37. Olga Trofimova | Interpreter |
| 38. Stein Larsen | Interpreter |

Attachment III

Presentations

