Abstracts for the Workshop on RW and SNF Disposal

1.1 The Global Status of Disposal of Radioactive Waste

Hans Forsstroem, IAEA

Radioactive waste has been generated since the start of the nuclear era. Radium waste was deposited close to the laboratory of Madame Curie in Paris. This has recently been the object of a remediation activity. Radioactive waste is generated from the nuclear fuel cycle, including the civil and military use of nuclear energy. It is also generated from the use of radioactive material in medicine, industry and agriculture. Today most of the waste comes from the civil use of nuclear energy. Worldwide almost 40 million cubic metres of waste has been generated, of which more than half has been disposed of.

The IAEA is in the process of introducing a new classification of radioactive waste based on the expected method for disposal. Six classes are introduced; Exempt Waste, Very Short Lived Waste, Very Low Level Waste, Low Level Waste, Intermediate Level Waste and High level Waste. The first two will not require regulated disposal, while the last four require disposal with increasing level of isolation.

Disposal facilities for Very Low Level Waste and Low Level Waste are in commercial operation in many countries. For some early disposal facilities remediation activities have been necessary. Facilities for Intermediate Level Waste are being developed. Only one facility, the Waste Isolation Pilot Plant in USA, is in operation. Technical solutions have been developed for High Level Waste Disposal. The first HLW disposal facilities are expected to be in operation around 2020.

International cooperation, through IAEA, is essential to ensure safety and non-proliferation, to ensure sharing of experiences and good practices and that adequate knowledge is transferred to new countries needing disposal facilities. International co-operation in R&D should be promoted. Also the possibility of sharing development and implementation of disposal facilities could be of interest for countries.

Further information of the work of the IAEA can be found at http://www.iaea.org/

1.2 Development of Systems for SNF and RW Management in the Russian Federation

Igor Gusakov-Stanukovich, Rosatom

The paper presents the prerequisites for the creation of state systems for SNF and RW management against the background of the Programme for Development of the Nuclear Industry adopted in Russia and also the process of solving the accumulated problems in RW and SNF management and decommissioning nuclear facilities.

The main directions of the strategy of the Russian Federation on management of RW and creation of the infrastructure for SNF management are also presented.

The principles of creation of systems for SNF and RW management have been formulated based on the international obligations of the Russian Federation.

1.3 The Draft Law on RW Management

Evgeny Evstratov, A. Agapov, S. Diakov, L. Slinchenko (Rosatom), I.Linge, V.Kovalchuk, O. Supataeva (IBRAE)

The presentation introduces the main provisions of the draft Federal Law on RW Management which is currently being developed in the Russian Federation.

The conceptual approaches contained in the draft law to categorization of RW are presented. The presentation defines the responsibilities of the Russian Federation and the Unified State System for RW management.

Detailed attention is given to the principles of 'special' RW management and liquidation of the nuclear legacy in this field.

Financial and motivational mechanisms in this sphere have been described. The notion of the 'national' operator of the system has been defined.

Information on the main steps in creation of the system for RW management has been presented.

2.1 Landfill repositories for Very Low Level Waste and its application in Sweden

Dr. Dan Aronsson, Ringhals AB, Sweden

Very low level waste (VLLW) represent such a low potential long term risk that it is justified to dispose the waste in repositories with no or simple engineered barriers; landfill repositories. In Sweden a series of landfill repositories for VLLW have been established at the site of three nuclear power plants and one nuclear research centre.

The advantage of local repositories are that the transport expenses are minimized, physical control of material is easy, the packaging requirements are moderate and environmental monitoring may be coordinated with the rest of the site. Consequently the cost per m3 may be kept low compared to other alternatives. In particular the logistics part may be kept at a reasonable low cost.

The different Swedish repositories have been in operation for up to twenty years with good experiences. The design has been adapted to local conditions and the technical solutions vary between the different sites. The licensing is done through two different legal frameworks, the Act on Nuclear Activities and the Environmental Code.

The requirements to the waste and conditioning are however similar and independent of the local design. These include a good record of nuclide contents, restrictions to short half-life (<5 years) isotopes, very hard restrictions on actinides contents, no contents of chemically hazardous material, nor materials that are likely to become attractive for reuse or recycling. An important requirement is also that the institutional control of the repository should be maintained for a long enough period to have a considerable decay of the waste.

The present repositories are licensed for operational waste only, but the law allows licenses to be granted for waste from decommissioning. There we foresee a development of the concept through the decades to come.

2.2 Design Solutions for Creation of Disposal Facilities for VLLW in the North-West Region.

Anatoly Demin VNIPIET, Russia

The paper deals with the main questions which influence the design solutions for VLLW disposal facilities. It starts with a short description of the problem of VLLW treatment in Russia with the view of the recently developed sanitary norms.

For the purpose of development of design solutions an analysis of VLLW characteristics has been performed.

Various concepts of design of the VLLW storage facility at the Andreyeva Bay have been evaluated. Based on the general criteria for storage facilities selection a site was identified at the Andreyava Bay and also the facility's design.

The survey of the main aspects has been done (capacity of the facility, type of packages, time of exploitation). These aspects have influenced the technical solutions for design development of the VLLW storage facility.

Preliminary results of economic assessments of the VLLW storage facility construction at the Andreyeva Bay, and also preliminary analysis of economic efficiency of separate disposal of VLLW and LLW have been done.

There is a need to develop specific methodology documentation to regulate safety in the course of VLLW management and special technical regulations for design of VLLW Storage facility.

3.1 Experience of Development and Siting a NSR in Lituania

Dainius Janėnas, Radioactive waste management agency (RATA), Lithuania

In this paper the experience of establishing a NSR in Lithuania is presented. Under preparation to the decommissioning of the Ignalina NPP the Lithuanian radioactive waste management agency (RATA) started establisment of a NSR. Role of independent waste disposal organization – RATA is underlined in proper planning of waste management system at a national level. A referente design for the NSR is described and criteria used for identification of prospective sites for detailed site investigations are discussed in the paper. It is shown that public acceptance and good relations with neighboring countries are not less important as geological criteria in selecting the site for the NSR.

Negotiations with Belarus and Latvia in accordance with international conventions and getting acceptance by local communities were the key factors in the final decision concerning the site for the NSR. International peer review by IAEA of major steps in this process and its importance for the approval by the Lithuanian authorities and in international discussions is emphasized as well. The review team of the IAEA concluded that the process of site selection was conducted according to international good practice.

Taking all aspects into account the Lithuanian Government in November 2007 confirmed the Stabatiškė site in the vicinity of Ignalina NPP as a site for construction of a NSR. Funding estimates and procedures for design and construction of the NSR are explained in the paper also.

3.2 40 Years of Operation of Near Surface Repositories. ANDRA Experience.

Jean-Louis Tison, ANDRA, France

The Centre Manche, the first French surface repository, was created in 1969 adjacent to the La Hague reprocessing plant. The nuclear research program both for power production and defense applications had generated large quantities of short lived low level/ intermediate level waste. Andra was created in 1979 and immediately took over the responsibility of the Centre Manche.

With the development of a large nuclear program, the Centre Manche capacity was rapidly depleted; (this site entered long term monitoring phase in 2003). It was then required to create a new disposal center; this was achieved in 1992 with the Centre Aube located in eastern part of France. The primary objective of the Centre Aube is to accept most of all operating waste generated by the nuclear power plants (except fuel) and other nuclear facilities. It is dedicated to short lived waste, low and intermediate level waste, with a minor quantity of long lived waste. The disposal method consists of placing waste packages in thick concrete vaults (2500 m^3 of waste in each vault). The vault is backfilled with solid material and closed with concrete. At the end of the operation, the vaults will be covered offering a long term protection. Safety relies on multibarrier system composed of waste package, the engineered barriers and the site geology. Required long term monitoring is expected to last 300 years for this repository. With a capacity of $1,000,000m^3$, the operating life expectancy is more than 50 years at present rate.

With the coming development of a large dismantling program for old nuclear facilities and the lack of clearance level in the regulation for very low level waste it became necessary to create a new type of disposal facility dedicated to very low level waste. It is an upgraded trench concept design located in a clay formation. Safety performance lies on clay and watertight liner. This Morvilliers repository located near the Centre Aube was commissioned in 2003. Capacity of 650,000M3 with a life expectancy of 30 years.

With the present surface repositories, a safe disposal solution is available for most of waste generated by the current operation and dismantling activities for Low and Intermediate Level Waste in France.

3.3 The Russian Federation plans for creation of near surface repositories for RW

Denis Kozyrev, Director General of RosaRao, Russia

In the near future the Russian Federation is planning a large-scale development of the nuclear industry. The principle condition for implementation of this task is creation of an effective system for RW and SNF management.

In order to solve the problem of RW management, taking in to account the need for decommissioning of the facilities, it is necessary to create a network of sites for RW disposal. In its turn, the arrangement of RW disposal requires creation of a solid legal base and further improvement of the legal and regulatory base.

The main objective of the draft Law on RW Management which must be adopted in the near future is to start a mechanism of solving the accumulated problems and preventing their appearance in future.

Creation of the infrastructure for safe management of RW with the aim of their final isolation is a fundamental task of the Federal State unitary Enterprise 'Enterprise for RW Management' (RosRao) which unites 15 specialised enterprises 'Radon'.

The Russian system of sites for RW disposal will include various (by the way of construction) types of facilities: local – at the sites of accumulation of significant amounts of RW which are difficult to extract; regional and federal – specially created facilities whose location satisfies all technical, political and social criteria.

To define the capacities of the regional and local disposal sites the volume of accumulated RW is divided according to the mode of their disposal.

The disposal of RW depending on the term of their potential threat could be done in near surface or underground repositories. Near surface repositories normally envisage the disposal of RW with or without the construction of barriers above or below the surface where the final protective cover is several meters wide. Having analysed the accumulated experience, first of all European, we can divide near surface repositories into two groups:
a) Located above the surface (taking into account the necessary preparatory steps: removal of soil, surface elevation etc.).
b) Located below the surface level in the frames of the aeration zone.

Safe isolation of RW in near surface repositories is guaranteed by a combination of protective engineering barriers which must have isolation properties, long time resistance to physical, chemical radiation and biological impact to prevent destruction of RW packages and spread of radio nuclides.

The selection of site for RW disposal depends on a number of factors: geological, hydrological, environmental, economic, legal, social and political.

An important place in creation of long term isolation facilities for RW is given to the development of acceptance criteria for long term storage and final disposal of RW, as obligatory requirements to the forms, containers and packages of RW That determine the acceptability of their location in facilities for long term storage or final isolation.

The leading organisations in designing facilities for storage and disposal of RW are entities reporting to the State Corporation for Atomic Energy: FGUP VNIPIPT , OAO GI VNIPIET, FGUP GSPI and a number of others. At present in the frames of the FGUP RosRao a work has started on optimisation of the design process, development of modern approaches to design of the whole infrastructure for RW management in Russia and also unification of design solutions.

3.4 Concept and programme for the realization of a radioactive waste repository for short-lived low- and intermediate-level waste in the Leningrad Region

Claes Lindberg, SKB International Consultants, Sweden

The Leningrad region hosts a large number of facilities that generate radioactive wastes. The need for disposal capacity to manage these wastes has been identified since long and several studies have been performed by Russian and international experts.

Following a study in 2007 financed by Sweden a Tacis project was carried out in 2008 in order to take the initial steps of the formal RF process to construct a repository in the Leningrad region for short-lived low- and intermediate level radioactive waste. The project was delivered by a consortium of Andra, DBE, NDA and SKB (project manager) in co-operation with VNIPIET in St.Petersburg.

The objective of the project was to assist the Russian Federation in the preparation of a sound basis for a decision to construct a repository in the Leningrad region, which could also serve as a pilot or model for similar repositories that need to be constructed in other regions of Russia.

Two alternative design concepts were studied, a surface disposal concept at ground level and an underground concept at limited depth below the surface. The concepts were evaluated in terms of technical feasibility and costs. Based on a limited screening process a few possible repository sites were identified out of which two were recommended for further studies.

Several areas for further work were identified. These include establishing reliable waste data for selection of a repository concept and for safety assessment as well as further site selection activities. A strategy and a plan for stakeholder communication were prepared in the project.

The new waste management organisation RosRAO took active part in the finalization of the project and is now prepared to continue to take the Leningrad repository project forward to implementation.

4.1 The road to a Deep Geological Repository in Sweden

Tommy Hedman, SKB International Consultants, Sweden

The Swedish Nuclear Fuel and Waste Management Co, SKB, has been commissioned by the nuclear power plant owners to manage and dispose of the nuclear waste in such a manner that human health and the environment are protected in both the short and long term, as well as to conduct the necessary research and development.

The management of radioactive substances is strictly regulated and implemented in full compliance with international standards. The focus of the work has furthermore been determined by a long series of political decisions and statements. The fundamental guidelines and division of roles for the management of nuclear waste from nuclear power production were laid down a long time ago.

SKB has for many years been operating a final repository for low- and intermediate-level waste (SFR), an interim storage facility for spent nuclear fuel (Clab) and a system for transporting the nuclear waste between the different facilities.

The disposal method for spent fuel, KBS-3, and the associated systems for manufacture and inspection of the barriers have been under development since the end of the 1970s. It has since served as a basis for SKB's programmes for research, development and demonstration. Regular payments to the Nuclear Waste Fund have ensured stable financing.

SKB is required to submit a programme for research, development and demonstration for approval every third year. The focus of the RD&D programme has varied through the years, depending on where the emphasis has been in SKB's activities.

Much of the research and development for encapsulation and final disposal of spent nuclear fuel needs to be done in a realistic setting. SKB now has three laboratories where we can carry out research and development projects on a full scale for all three barriers in the final repository. The results of the experiments and projects in the three laboratories serve as a basis for designing the final repository and the encapsulation plant and for the safety assessments that will be conducted.

At the same time we have acquired knowledge of Swedish bedrock, what properties the rock must have and how the engineered barriers should be designed to satisfy the existing requirements. The methods and technology for building and operating the repository has also been tested. A lot of research and technical development is being conducted in close cooperation Posiva in Finland.

Siting of the remaining facilities in the system is based on a stepwise process with well-underpinned and firmly anchored decisions. At the end of 2006, SKB submitted an application for the encapsulation plant and in the mid of 2009 we intend to select the preferred site for the repository. The timetable for building and commissioning the facilities needed for final disposal of the spent nuclear fuel – encapsulation plant, final repository and transportation system – will be presented.

4.2 Implementing Deep Geological Disposal In UK

Neil Smart, Nuclear Decommissioning Authority, UK

With the publication of the Managing Radioactive Waste Safely (MRWS) White Paper in June 2008, a major milestone was achieved in determining future UK Government arrangements for the long term management of higher activity radioactive waste.

The MRWS programme led to publication of the White Paper. This includes the work undertaken by the independent Committee on Radioactive Waste Management (CoRWM) to assess the available options and the consultation undertaken to establish a framework for implementing geological disposal which, together with safe and secure interim storage, was identified as the best approach.

A summary of the higher activity radioactive wastes that the UK expects to have to deal with and the programme for implementing geological disposal will be provided. The necessary regulatory measures that will have to achieved and how a site will be selected using a voluntarism and partnership approach will be addressed.

4.3 Disposal of Radioactive Waste and Spent Nuclear Fuel: Canadian Experience and Plans

Michael Washer, Canada

Radioactive wastes have been produced in Canada for over 70 years. The volumes of spent nuclear fuel and radioactive wastes have grown significantly given nearly 50 years of active nuclear power generation.

The issue of how to deal with nuclear wastes in Canada has long been a source of considerable public discourse. The path to addressing nuclear wastes on a national basis started over thirty years ago with the issue of the "Hare Report" in 1977. This subsequently led 10 years later in 1988 to the first comprehensive environmental assessment (EA) of the 1977 recommendation to use underground disposal. The report however found that the use of underground storage did not have broad public support. This led to the recommendation for the creation of a waste management agency to study options and to derive a way ahead.

Canada enacted the Nuclear Fuel Waste Act in 2002. This Act established the legal framework for this agency the 'Nuclear Waste Management Organization' (NWMO) and the inherent obligation of the government to accept this new organization's recommendations.

NWMO completed a comprehensive review 2002 – 2007 leading to the recommendation of an "Adaptive Phased Management" approach. The Canadian government in June 2007 accepted this approach and recommendation.

From a technical point of view Adaptive Phased Management (APM) approach has an end point of isolation and containment of used nuclear fuel in a deep underground repository. Equally important though is that APM is a management methodology for the engagement of Canadians allied with a fair and open process for site selection and technical adaptation.

Canada's NWMO is now engaged in a five year implementation plan to potentially establish the first such deep repository. This year (2008/09) the agency's thrust is design of the process for site selection centered on the principles set out in the APM methodology.

The lessons learnt from Canada's experience are:

- **Time:** The issues involved are complex and far reaching needing time to develop a coherent approach (over thirty years);
- **Public opinion:** Public opinion and support is critical
- **Legal Framework**: Strong legal framework required to provide structure, define responsibilities and assure access to funds specially set aside;
- **Funding:** Funding resources are significant ($6 Billion CAD net present value to address Canada's wastes);
- **Disposal in geological formations** with ability to retrieve is direction for Canada's nuclear wastes.

4.4 Update on French Deep Geological Program for High Level Waste.

Jean-Louis Tison, ANDRA, France

In 2009, the Deep geological Program dedicated to high level waste is in progress. Present targeted date for the commissioning of a repository is 2025 with the objective to offer a disposal solution for all high Level Waste in France, generated mainly by the present fleet of 58 Nuclear Power Plants in operation.

After initial exploration studies of the 80's, an Underground Research Laboratory was built in the late 90's in a Clay formation, 130m Thick, at a depth of 500m in Bure , located in the eastern part of France. In 2005, technical feasibility of deep geological disposal in this area was established and confirmed by different external reviews.

In 2006, deep geological disposal was confirmed by the French parliament through a law as being the ultimate solution for High Level Waste. The parliament has also established deadlines for the completion of the program.

Andra, the French Waste Management Organization has a mandate to file an application for the repository in 2015 in the vicinity of Bure, after conducting additional technical studies. Public debate and involvement of local territories will have to take place before. Immediate objective for 2009 is to select a 30KM2 area where the repository will be located.

4.6 IAEA Networking Activities on Underground Research Facilities

Hans Forsstroem, IAEA

Since 2001, the IAEA has successfully operated the IAEA Network of Centres of Excellence for Training in and Demonstrations of Disposal Technologies in Underground Research Facilities (URF Network), which has been shown to be a very effective and efficient vehicle for training of professionals in the field. Using this positive experience of "networking" international efforts, the IAEA is planning to improve its response to the growing number and complexity of requests from Member States (MSs) in a cost-effective manner by introducing similar Networks in other activity areas.

In 2001, under the auspices of the IAEA, a number of MSs with operational underground research facilities ("Members"), came together in a Network and offered the use of their facilities for joint training and R&D activities to countries having less advanced programmes ("Participants"). The Network provides a mechanism to ensure that all MSs are aware of the state-of-the-art technologies developed internationally for geological disposal of high-level, long-lived and spent fuel waste. The programme is based on in-kind contributions from Member countries and specific requirements of Participant countries. The membership of the core group is dynamic to cope with programme's developments in both Member and Participant countries and availability with time of further underground or even surface facilities (universities, research centres). Till now more than 200 people from over 20 countries have taken part in 16 training courses. The overwhelmingly positive response by MSs to the activities of the IAEA Network during the past years has demonstrated that the project is providing important benefits, not available through other avenues. Major national and multi-national experiments continue to be undertaken at the URFs and are also becoming foci not only for training courses but also for hands-on training and fellowships sponsored by the IAEA Technical Cooperation Department. Coordination and programming is provided by the Nuclear Energy Department.

With regard to additional Agency-sponsored Networks, initiatives such as the International Decommissioning Network (IDN) launched in September 2007 are expected to play a pivotal role similar to the above. The IDN is bringing together those with relevant decommissioning knowledge and experience and those who need to apply it, and provide a means to build and sustain relationships through the sharing of this knowledge. It is open to all MS organizations engaged in, or actively planning for, decommissioning. Along this line, another Network to bundle international efforts in low-level waste disposal area – DISPONET – is also currently being developed.

4.7 Construction of the Deep Geological Disposal Facility for Final Isolation of High-Level Waste in the Nizhnekansky Rock Massif (Krasnoyarsk region)

E.G.Kudryavtsev, I.V. Gusakov-Stanyukovich (ROSATOM), E.N.Kamnev, N.F.Lobanov, V.P.Beygul (VNIPI Promtekhnologii), Russia

The Federal Facility for final geological isolation of conditioned HLW and ILW containing long-lived radionuclides, including transuranium ones, is intended to be constructed in the rock massif of low permeability that is locatedon the site «Yeniseysky», within ZATO Zheleznogorsk, Krasnoyarsk region. The total volume of disposed RW would be no less than 500,000 m^3.

The promising Subsite 37 has been found for further investigations and, if possible, for the underground RW disposal construction. The Subsite 37 is located 4 km from MCC and of 4.5 km from the river Yenisey. The depths of RW disposal are considered to be about 500 m; the size of the sub-site is required to be about 1km^2.

From 2002 to 2005 a series of geophysical investigations were carried out on the surface of the site and three 100m deep boreholes and an additional 600m one were drilled. The complex of geophysical and laboratory investigations has been fulfilled in the mentioned above holes. According to preliminary estimations the rock massif at the chosen subsite has appropriate properties to ensure safe isolation of RW.

According to the Federal Standards, additional works have to be performed to confirm the appropriateness of the preliminary recommended Subsite 37 for full-scale facility construction. The technical aspects of the underground facility for final isolation of long-lived RW with low heat generation and technology decisions for facility construction and operation have been developed.

The Federal Disposal Facility for final geological isolation of long-lived radionuclides together with the future Plant for processing of light-water reactor SNF will be important components of the Common State System for management of SNF taking into account the prospects of considerable growth of the Russian nuclear power industry.

4.8 Russian-German R&D Cooperation regarding HLW Disposal in the Krasnoyarsk Region

Jürgen Krone, DBE TECHNOLOGY GmbH, Germany

From the middle of the 90s various Russian organisations (Radium Institute, IGEM, VNIPIPT) started to investigate potential suitable sites and to develop concepts for disposal of high-level and long-lived radioactive waste in the Krasnoyarsk region. After a preliminary siting study this work focussed on the Nishnekansk Granitoid Massif near the Mining-chemical Combine. In the corresponding concept development the disposal of solidified pulps from former weapon plutonium production, fractioned reprocessing waste from the planned reprocessing plant RT-2 as well as spent nuclear fuel, including spent MOX fuel not suitable for reprocessing has been considered.

Based on the agreement between the former MINATOM and the German Federal Ministry of Economy from June 2001 to enter in an R&D cooperation regarding radwaste disposal German experts from BGR, GRS and DBE TECHNOLOGY collaborated with Russian experts in investigating various specific issues regarding the above mentioned disposal project over more than 7 years. Thanks to this close cooperation they were able to gain detailed insights on the work performed by the involved Russian organisations so far and to develop recommendations for the continuation of these efforts by the Russian experts. Another goal of this cooperation was the communication of international accepted safety approaches on this very subject. The main joint investigation results were published in reports in Russian and German language.

Based on a sufficiently detailed investigation of available site characteristics the first years were devoted to deriving together a total performance assessment driven site investigation and selection approach that resulted into the identification of major deficiencies regarding the existing data as well as into a set of recommendations for the further planning of site investigation work.

In parallel a preliminary repository concept has been developed and a rough technical plan and cost estimate for its implementation have been outlined. In the context with weapon plutonium disposition studies this technical-economic concept has been modified for long-term storage and disposal of spent MOX fuel.

In response to an ongoing dispute between various Russian experts on the importance of the geological and engineered barriers for the safety of HLW disposal in magmatic host rocks the performance and role of the various barriers has been investigated following a safety function based approach. These investigations were performed using preliminary site investigation data from the

Yenisseysky site that is located on the border of the Nishnekansk Granitoid Massif and is considered in past by VNIPIPT as preferred site thanks to its short distance to the Mining-chemical Combine.

The presentation will provide on overview on the jointly performed investigations as well as on the lessons learned from it.

4.9 UNDERGROUND LABORATORY AND NATURAL ANALOGUE OF AN SNF REPOSITORY IN GRANITE: AN EXAMPLE OF THE ANTEI DEPOSIT

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An experience of functioning of URLs located in granite massifs of Sweden (Äspö), Canada (Whiteshell), Switzerland (Grimsel), Finland (ONKALO), and Japan (Mizunami) will be utilized during design and construction of URL in Russia, probably within the Niznekansky granite massif in Krasnoyarsk region. This experience (tracer, heating tests, *etc*.) shows, that for estimating of transport mechanisms of radionuclides (actinides) in fractured-porous environment the data on uranium deposits – natural analogues of FEPs in the SNF (95% of UO2) repositories – have to be taking into account. Such deposits in granites as El Berrocal (Spain), Palmottu (Finland), Sanerliu (China), and Kamaishi (Japan) are natural analogues.

However URLs and deposits are located in different geotectonic, hydrogeological, redox *etc*., conditions that lead to uncertainties and inconsistencies for Performance and Safety Assessment of the repositories. It is possible to remove these ambiguities if generic URL is organized at the uranium deposit where ore bodies are located at the depth of SNF repository horizons. At present, the Antei veinstockwork uranium deposit in the south-eastern Transbaikal region is such an object. The deposit is located in Paleozoic granite at depth from 400 to 1000 m where pitchblende ore bodies are opened by highly branched workings. That is why the Antei deposit is under investigation in the frame of Presidium of RAS Programme No. 16 for developing of SNF long-term isolation issues in detail.

The main aim of this contribution is to present data on initial results, to discuss directions of further investigations and application of observed data to scientific provision of R&D programme of the URL construction in Russia.