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

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The Atomic Industry Development Program of the Russian Federation (RF) provides for the increase of the share of electric energy produced by nuclear power stations up to 25 %. This fact means that corresponding infrastructures for management of spent nuclear fuel (SNF) and radioactive waste (RW) will be required.

Two most important infrastructural facilities of RF Common State System for Management of SNF will be constructed, namely: the Plant for Processing of Light-Water Reactor SNF on Mining and Chemical Combine (Krasnoyarsk region) and Deep Geological Disposal Facility (constructed in complex with the Plant) for final isolation (disposal) of RW into Nizhnekansky rock massif, Krasnoyarsk region.

Additionally, this RW Disposal Facility would be used for environmental safe and economically sound disposal of other large volumes of RW containing long-lived radionuclides, namely:

- RW being accumulated as a result of radiochemical processing during the implementation of defense programs in Russian Federation, and
- RW being generated during operation of power reactors (and transport ones) as well as decommissioning reactors if these RW could not be final safely disposed at near-surface repositories.

Radioactive waste for disposal

The most effective method of long-lived RW final isolation is their disposal into deep geological formations. During last 45 years, about 50 millions m^3 of liquid RW have been isolated into deep separated horizon-collectors at Mining and Chemical Combine (MCC) and Siberian Chemical Combine (SCC).

At the same time significant volumes of liquid and solid RW formed by radiochemical processing and have to be conditioning are stored at temporary repositories at MCC, SCC and Production Association «Mayak» (PO «Mayak»). Significant part of named RW contains of long-lived radionuclides and they will be hazardous to the environment for many thousands years. More than 80% (vol.) of those RW contain transuranium elements including uranium, americium, plutonium, and neptunium.

Stored liquid and solid RW should be taken out from temporary repositories, then conditioned and packed into containers to send to Zheleznogorsk (Krasnoyarsk region) where they are intended to be disposed into deep geological formations.

According to the preliminary estimations, total volume of conditioned long-lived RW that could be finally disposed on the site “Yeniseysky” (Nizhnekansky massif) are no less than 500,000 m^3, including previously accumulated ones (up to 450,000 m^3, see Table 1).

Table 1. Estimated volumes of final disposed long-lived RW on the site "Yeniseysky"

Types of RW	RW volume*, $x10^3 m^3$	RW parameters	Main radionuclides
Conditioned long-lived RW: high-level (HLW) and intermediate-level (ILW), stored at MCC, PO «Mayak», SCC	Up to 450	Low heat generation, specific activity is less than $2*10^9$ Bq/kg	U, Pu, Am, Np, Cs, Sr
Conditioned fractions of long-lived HLW and ILW will be produced under SNF processing at MCC in future	Up to 50	Parameters would be defined as a result of experimental works on MCC Development& Demonstrational Centre	U, Pu, Am, Np, Cs, Sr
Conditioned "hot" fractions of HLW will be produced under SNF processing at MCC in future **	Up to 1	High specific activity and heat generation	Cs, Sr
Some types of solid HLW containing of nuclear materials (in potential)**	Up to 100	High specific activity and heat generation	similarly to SNF

* Volumes of RW could be finally disposed ** RW would be directed to dispose after long-term cooling storage.

Preliminary justification of site and sub-site for RW disposal

From 90th the investigations of Nizhnekansky rock massif to find the promising site for RW final disposal have being performed by experts of «Rosatom» enterprises, scientists from Russian Academy of Science (RAS), geologists of Krasnoyarsk region.

Based upon fulfillment works the "Declaration of Intentions" for construction of the underground research laboratory had been developed and was approved in 2002. For the location of laboratory two sites were defined, namely: "Verkhneitatsky" (it includes two subsites – "Itatsky" and "Kamenny") and "Yeniseisky" (see Figure 1).

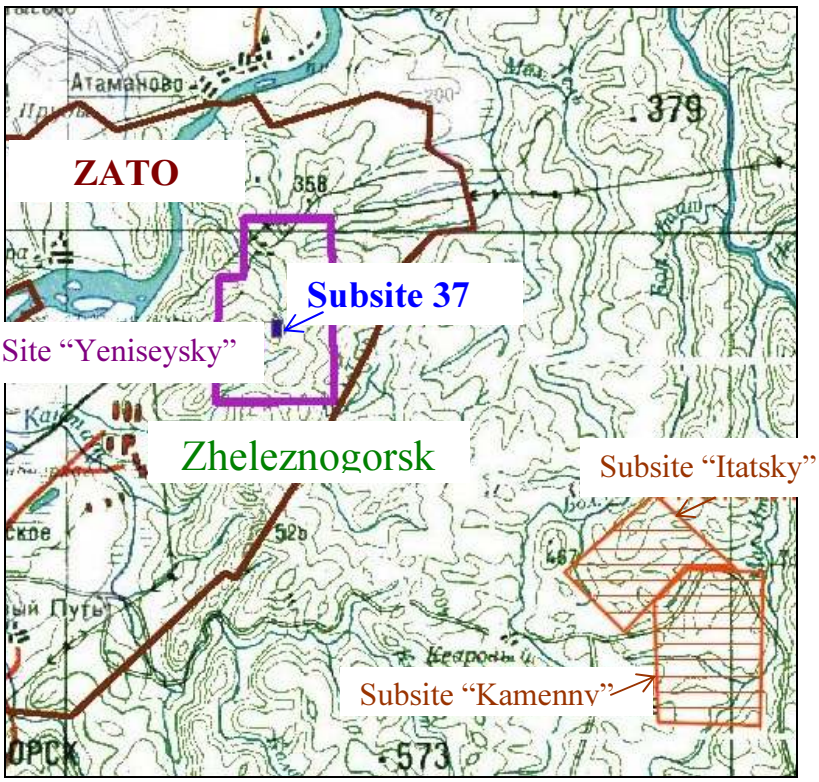

Figure 1. Scheme of the site and subsites locations of the facility for RW final disposal

According to official state solutions concerning Russian Atomic Industry development, the substantiation of the project "Construction of the top-priority facilities for final isolation of radioactive waste on Krasnoyarsk region, Nizhnekansky rock massif" was included in Russian Federal Traget Program "Maintenance of nuclear and radioactive safety on 2008 and up to 2015".

In 2008 the "Declaration of Intentions" for the construction of the top-priority facilities for the final disposal of RW, which included construction of underground research laboratory, was created. Differences between new «Declaration» and previous one are listed in Table 2.

Table 2. Comparison of new «Declaration» and previous one

Subject	"Declaration of intentions"	
	2002 (previous)	2008 (new)
Purposes of the disposal construction	Disposal of solidified fractions of RW produced by the plant RT-2	Final disposal of : - accumulated long-lived HLW and ILW; – solidified fractions of SNF processing on MCC in the future
Content of "Declaration of Intentions"	Statement of construction of underground laboratory (only)	Statement of construction of the RW disposal including the construction of underground laboratory
Investigations and sites	In underground facilities of MCC (from 1965) Within region and on the site "Verkhneitatsky" (1993-2000)	Complex investigations on the site "Yeniseysky" to specify its parameters (2002-2005). Comparison of sites availability
Site availability	"Verkhneitatsky" is basis site "Yeniseysky" is alternative site	"Yeniseysky" (within ZATO) is basis site
Technology of SNF processing	PUREX (technology disadvantage: production of large volume of RW)	Innovation technology of SNF processing are developing on MCC

In 2002-2005 (ISTC Project #2377) the complex geophysical investigations were carried out on a surface of the site "Yeniseisky" (firstly at an area of 70 km^2 then at the area of 25 km^2 more in details) as well as an explorations included drilling of three holes by depth of 100 m and additional one of 600 m. Laboratory research of rocks and underground waters has been performed. Table 3 specifies testing results for rocks and underground waters down to depth of 600 m in the close vicinity of the deep hole of 1-E.

Table 3. Characteristics of rock massif at the site "Yeniseysky" (in the vicinity of deep hole of 1-E)

Bedding range (thickness) of layer, m	Rocks description. Rock-hardness ratio (f)	Filtration coefficient (K_f), m/day; pH, Eh of underground waters
0-6 (6)	Soil-vegetable layer; crushed rocks	-
6-60 (54)	Erosion crust zone. High fractured rocks, f = 3.	-
60-303 (243)	Massive plagiogneisses: fractured and high fractured are down to depth of 276 m. Lower ones are weak fractured, f = 6.	K_f = 0,001-0,005
303-342 (39)	Massive dark-gray meta-bazites weak fractured, f = 7-9	K_f = 0,004; pH = 8,4; Eh = (-60 mV)
342-495 (153)	Massive plagiogneisses and biotite-feldspar gneisses. High hardness, weak fractured, f = 9-12	K_f = 0,002-0,0009; pH = 8,6; Eh = (-80) mV
495-600 (105)	Massive dark-gray meta-bazites of micro-granular structure. High hardness, weak fractured, f = 7-12	K_f = 0,001-0,0005; pH = 8,7; Eh = (-100) mV

Based on the results of the all investigations had been carried out in 1993-2005, within the premises of "Yeniseisky" the promising Subsite 37 was found. Detailed geological and engineering

survey should be carried out to confirm the possibility of Subsite 37 using for location of underground facility for final isolation of conditioned HLW and ILW containing long-lived radionuclides. This subsite is located at the distance of 4 km from MCC and 4.5 km from river Yenisey, and it is placed within the premises of Closed Administrative &Territorial District (ZATO) of Zheleznogorsk (see Figure 1).

Preliminary results of fulfilled investigations are specified below.

Tectonic features of Subsite 37 are as follows. Subsite 37 is located in the block of relatively uniform rocks. Block size is of 4×5 km. This block is bordered by preliminary separating third order faults. Faults are dying out in a depth and characterized by low contrasting anomalies. This fact in its turn is evidence of faults healing by dikes. Conclusion could be made that any tectonic activities are absent at this stage.

There were not found any ascending sources of chloride underground water in the depths of the site "Yeniseysky" as well as any other evidences of unloading from the deep horizons. Descending filtration of underground water is preferable on the site. Also the results of helium content measurements have confirmed the absence of ascending fluid filtration from deep horizons.

Ages of rocks at the depths of underground facilities location are of more than 1800 million years. Ages of underground waters below 200 m are of 7 thousands of years and more.

Rock massif at the site "Yeniseysky" has got stable tectonic regime, that has being confirmed by field observations of relief tiers and topographical maps analysis and data on geodesic control of the rate of the surface uplift. Average rate of this region uplifting for last 5 million year have not exceeded 0.08-0.09 mm/year (up to 9 m of height for 100,000 years). At the subsites within that site the respective values are less.

Observation results and calculations have confirmed the extremely low tectonic uplifts of the rock massif. It is corresponded to platform type of region evolution and its weak tectonic activity.

In accordance with fulfilled research the following conclusion was made. Recommended Subsite 37 is located within the rock block that bases on the large intrusive massif of basic rock. According to the preliminary estimations the intrusive massif is placed at the depth of 1500 m. Its size is 60 km^2 in comparison to size of recommended Subsite 37 for the underground facility which is less than 1 km^2.

Any construction of the underground disposal would not be subjected to intensive dynamic stresses because of unloading of arising tectonic stresses takes place on the boundaries of stable matters (in this case, it takes place on the faults surrounding intrusive rock massif under consideration).

Criteria that were set by normative document NP-055-04 "Disposal of radioactive waste. Principles, criteria and common requirements for safety insurance" have been used for preliminary substantiation to select the location of underground RW disposal. Table 4 specifies the conformity of the recommended Subsite 37 characteristics and criteria of mentioned document.

Table 4. Selection criteria for underground RW disposal location at site "Yeniseysky"

Basic criteria
Subsite 37 is NOT placed on the region possessing active earth movements or high seismic activity or intensive tectonic movements
Size of Subsite 37 is ENOUGH for all facilities placing
Enclosing rocks are crystalline magmatic or metamorphic rocks with favorable physical &mechanical properties and uniform structure and weak fracturing
Underground waters are characterized by the reduction nature and light alkaline properties and low mineralization
Active faults ARE ABSENT within the Subsite 37
Any connections of underground facilities with earth surface or/and aquiferous horizon ARE ABSENT

Additional criteria
Optimal technical and economic indices of the underground disposal facility are expected along with ensuring of safe standards for RW disposal
Technological shaft and routes of RW container transportations are desired to be placed within territory of ZATO Zheleznogorsk

According to the preliminary estimations the rock massif under consideration is characterized by the favorable properties which guarantee the safety of final isolation of RW containing long-lived radionuclides.

These characteristics are as follows:

- Weak tectonic activity; rocks are characterized by high hardness and weak fracturing on the depth of facility creation,
- Underground waters are fresh and characterized by light alkaline properties and reduction ones; coefficients of filtration are of several mm/day or less; infiltration of underground waters is descending.

Table 5 specifies summary for comparative estimation of prospects of both of alternative sites "Yeniseysky" and "Verkhneitatsky" (by the results of fulfilled investigations).

Table 5. Comparative estimation of the sites for final RW disposal location

<table>
<tr><td>Site "Yeniseysky" (1)</td><td>Site «Verkhneitatsky» (2)</td><td>Conclusion</td></tr>
<tr><td colspan="3">Both sites are suitable for the underground RW disposal</td></tr>
<tr><td colspan="3">Both sites have been investigated enough to develop the "Declaration of Intensions"</td></tr>
<tr><td colspan="3">Both sites are appropriate to locate subsite of necessary size</td></tr>
<tr><td colspan="3">Both sites are appropriate by hydrogeological characteristics of rock massif:
the filtration coefficients values are of several mm/day or less at a depth below 400 m</td></tr>
<tr><td colspan="3"><u>Rock parameters</u></td></tr>
<tr><td>There are high hardness and weak fracturing rocks and underwater possess reduction properties at a depth below 300 m</td><td>There are high hardness and weak fracturing acidity granitoids at a depth from 100 till 700 m (except of 380-480 m)</td><td>Both sites are appropriate</td></tr>
<tr><td colspan="3"><u>Infrastructure availability</u></td></tr>
<tr><td colspan="2">Distance from MCC</td><td rowspan="2">Location of the site 1 is preferable</td></tr>
<tr><td>About 4 km</td><td>About 24 km</td></tr>
<tr><td>Site is situated within ZATO (Zheleznogorsk); exist infrastructure could be partially used</td><td>Grade and full scale infrastructure should be done, including construction and further exploitation of engineering and transport communications</td><td>Location of the site 1 is rather preferable on required inputs</td></tr>
<tr><td colspan="3"><u>Overall conclusion:</u> Site «Yeniseysky» is preferable</td></tr>
</table>

According to the fulfilled investigations at the site "Yeniseysky", it has been recommended to perform detailed geological engineering survey at the promising Subsite 37 according normative documents.

Multi-barrier protection system

According to IAEA recommendations, and Russian Federal standards, and experience of complex research at international underground laboratories the safe RW final isolation must be provided by using multi-barrier system. During the construction of underground facilities in rock massif on the site "Yeniseysky", the safe final RW isolation after conservation of cell containing RW would be executed in the following way:

Engineering barriers that prevent contacts of underwater and RW would execute the isolation functions at the first stage.

Geochemical barrier would be formed as a result of long-term corrosion of engineering barriers. It would provide localization of radionuclides that are being low solubility of radionuclides at reduction media as well as high sorption properties of products of iron corrosion.

Favorable conditions into enclosing rock massif (see Table 6) would guarantee safety RW localization in closed vicinity of facilities even taking into account possible emergency situations.

Table 6 specifies the information concerning isolated properties of main elements of multi-barrier system of geological RW disposal in the site "Yeniseysky".

Table 6. Elements of multi-barrier protection system and its properties

Elements of multi-barrier system	Isolated properties
Engineering barriers (matrix containing RW, cask, cement & bentonite filling)	Prevention of underground water contact with RW during up to 1000 years (if negligible water cycling and non-aggressive underground waters are placed)
Geochemical barrier	- reduction media and diffusive conditions in the system of engineering barriers; - high sorption properties of products of iron corrosion
Low-penetrating enclosing rock massif (depth of the RW disposal is about 500 m)	- weak tectonic activity in the region; - high hardness and weak fracturing rocks on the depth of facility creation; - underground waters are fresh and characterized by light alkaline properties and reduction ones; - coefficient of filtration is of several mm/day or less; - infiltration of underground water is descending

Using of numerical simulation one could provide reliably safety of final isolation of long-lived radionuclides (U, Pu, Am, Np) as well as other ones rather low hazardous for environment if solidified RW packaged were placed into low-penetrated rock massif at depth of about 500 m.

Radius of approvable concentration (minimum significant specific activity) of radionuclides mentioned above in underground waters in fractured zones will not exceed 100 m even if the elements of engineering barriers system are degraded. Beyond these bounds the polluted underground waters should not belong to liquid RW.

Taking into consideration several aspects, namely:

- isolating properties of engineering barriers system
- weak fracturing of enclosing rock massif
- reduction properties of underground water
- descending manner of underwater infiltration in the site «Yeniseysky»

radionuclides certainly not ever leave from the depth of 500 m to the sphere of vital activity.

Further geological engineering survey at the site and investigations at underground laboratory

To obtain more accurate and detail structural & tectonic and hydrogeological parameters of the rock massif as well as physical and chemical parameters of rocks at Subsite 37 it have been planned to perform the follow works: complex geological and engineering survey includes drilling of deep holes each of 600-700 m with full recovery of cores and carrying-out of complex of geophysical, hydrogeological and geochemical investigations. As a result of fulfilled investigations the information concerning enclosing massif will be obtain that are enough to design the facility for underground RW disposal.

Further, on the stage of underground laboratory building, two shafts will be constructed and complex geological engineering survey will be performed**,** namely**:** at the depth of 500 m the horizontal drifts of 1600 m will be constructed from which six horizontal exploring holes (each of length of 250 m) will be drilled (see Figure 2). A lot of investigations will be carried out, namely: geophysical research in holes, hydrogeological survey, complex study of the tectonic structure and the stress-strained state of rock massif, physical-mechanical, thermal-physic, filtration and sorption properties of rocks (See Table 7).

Table 7. Work need to be implemented for repository design

1. Complex of engineering survey at the surface	
2. Investigations of rock massif from a depth of 0 -700 m and at the horizon of 500 m	
Exploring holes, horizontal drifts	Investigations
- five-seven holes of a depth of 600-700 m with full recovery of cores - drifts of 1600 m at the horizon of 500 m - six horizontal holes of 250 m at the horizon of 500 m	– geophysical study at holes – hydrogeological interval testing – complex study of tectonic structure and stress-strained state of rock massif, physical-mechanical, thermal-physic, filtration and sorption properties of rocks

Table 8 specifies short description of the main investigations that are needed to be performed at underground laboratory. Some investigations could be carried out at the branch of underground laboratory in parallel manner with the facility construction. The branch of laboratory might be constructed at special selected section in any existing underground drift of MCC.

In future that section could be used for final isolation of some RW accumulated at MCC.

Table 8. Lines of investigations at underground laboratory

Underground drifts and exploring holes at horizon of 500 m	Investigations at underground drifts and exploring holes during geological engineering survey
	Development of technologies of facility construction and load-haul-dump cycle doing and closing-down of chambers contained RW
Underground drift of MCC (branch of underground laboratory)	Development of technology of engineering barriers construction and underground load-transporting of containers and also laying up of chambers after containers were placed
	Development and testing of ecological mining monitoring system to control underground facilities of RW disposal
	Demonstration of the technology of underground RW disposal and ecological mining monitoring system

Large part of investigations that are usually being performed into specially built underground laboratories will be performed during geological engineering surveys at horizon of 500 m (See Table 7 and 8). Additionally, results of long-term investigations of MCC underground facilities will be used namely:

- real measurements of rock massif structure and long-term stability of underground facilities
- Investigations of temperature fields' extending in near-contour zones of underground facilities
- real investigation of radionuclides geo-migration in engineering barriers and fractured zones
- Laboratory study of extraction/ sorption/ migration of radio nuclides.

During more than 40 years the investigations have being curryed out in natural conditions and under human activity as well included effects of heat sources of large size (heat exchangers of underground nuclear reactors). Summarizing of the results of long-year investigations was made in the frame of ISTC project #307B.

In the frame of ISTC project #2764 the information technology to estimate structure-tectonic parameters of rock massif for HLW disposal has been developed. New algorithms of geological-geophysical and geo-morphological analysis have been developed for selecting deep structural heterogeneities and active geodynamics zones in heterogenic block media. Preliminary stage of work on GPS and GLONASS systems application to observe the modern crust movement in Nizhnekansky massif has been done.

Later on in the frame of preparing ISTC project #3914 it is planning to develop numerical simulation and long-time forecast of evolution of stress-strained state of rocks. As a basis for these works, geodynamics net would be made in Nizhnekansky massif, including site "Yeniseysky" as a part. Results of the observation of rock blocks deformations by space geodesic techniques and stress field reconstructions would be used.

Main technology decisions and technical and economic characteristics of the facility

Technical aspect of the underground facility for final isolation of long-lived RW with low heat release (see Table 9), and technology decisions for facility construction and operation have been developed (see Table 10).

Table 9. Components of underground RW disposal

Vertical shafts of 500 m of depth for different using, namely: exploring-operational, technology, ventilation and auxiliary ones (for 2nd stage)
Horizontal drifts of 250 m (each one) at horizon of 500 m for RW disposal
Drifts for transportation and ventilation, horizontal drifts and chambers for auxiliary using
Underground near-shaft chambers, and chambers for preparing and holes for transporting of filling mixer
On - surface complex of buildings and constructions

Table 10. Scheme of RW handling up to its final disposal

Preliminary technological operations **(at MCC, PO "Mayak", SCC)**
◆ RW retrieval from of temporary repositories ◆ RW conditioning and packing into disposal containers ◆ Loading of disposal containers into multi-used transport containers for rail train transportation to Zheleznogorsk
Delivery of transport containers with RW to MCC.

Unloading of containers with RW
Technological operations at underground RW disposal site
◆ Delivery of disposal containers to technological shaft
◆ Loading of platform with containers into the mine cage ◆ Descending of mine cage on horizon of 500 m
◆ Delivery of platform with containers to disposal chamber ◆ Placing of containers with RW into disposal chamber in four layers by a height
◆ Stage-by-stage final conservation of disposal chambers

Table 10 specifies the preferred way of accumulated RW handling. It shows preliminary technological operations for RW preparation. There are separately shown should be executed at the Combines, that include RW conditioning, loading into containers and its transportation to MCC for underground RW disposal.

According to the preliminary estimations the containers of NZK-150-1,5 by storage capacity of 1.5 m^3 of RW or other containers of the same size but possess of improved biological defense properties could be used for RW disposal.

Complex of rock drifts will be constructed on the depths of 500 m on the square of 1 km^2. These facilities include chambers to place containers, horizontal and vertical drifts to provide ventilation, transportation of materials and equipments as well as chambers of auxiliary using.

After containers have been placed, spacing into disposal chambers is provided to be filled up stage-by-stage by cement & bentonite filling. Its transportation into the chambers will be from horizons of 470 m.

The size of Subsite 37 for the facility location is of 600*1430 m. The dimensions of subsite could be changed in accordance to forthcoming geological engineering surveys without change of its square size.

Construction of the facilities and its putting in the operation are scheduled to perform in two stages; each stage is concluded for 250,000 m^3 of RW.

In the frame of the First Stage following works should be made:

- Construction of Underground Laboratory and
- Constructing and its putting in the operation of Starting Complex, which are designed for disposal of 10,000 m^3 of RW, and then
- Constructing and operation of underground facilities of First Stage (intended for disposal of 5,000 m^3 of RW per year) including final conservation of chambers with RW.

Figures 2 and 3 show the schemes of shafts and drifts and exploring holes of Underground Laboratory and facilities for deep RW disposal. Underground facilities of the Second Stage are shown by dotted line. Under preliminary estimation the period of time to construct the Underground Laboratory will be of 5 years; constructing and putting in the operation of Starting Complex for 10,000 m^3 of RW will require of 9 years (including construction of Underground Laboratory).

According to the preliminary assessment, investments are required to construct and to put in the operation of Starting Complex for 10,000 m^3 of RW would amount of 20.8 billions of rubles (in prices of 1st quarter of 2008). It includes of financing of Underground Laboratory construction that would be equal to 5.6 billions of rubles.

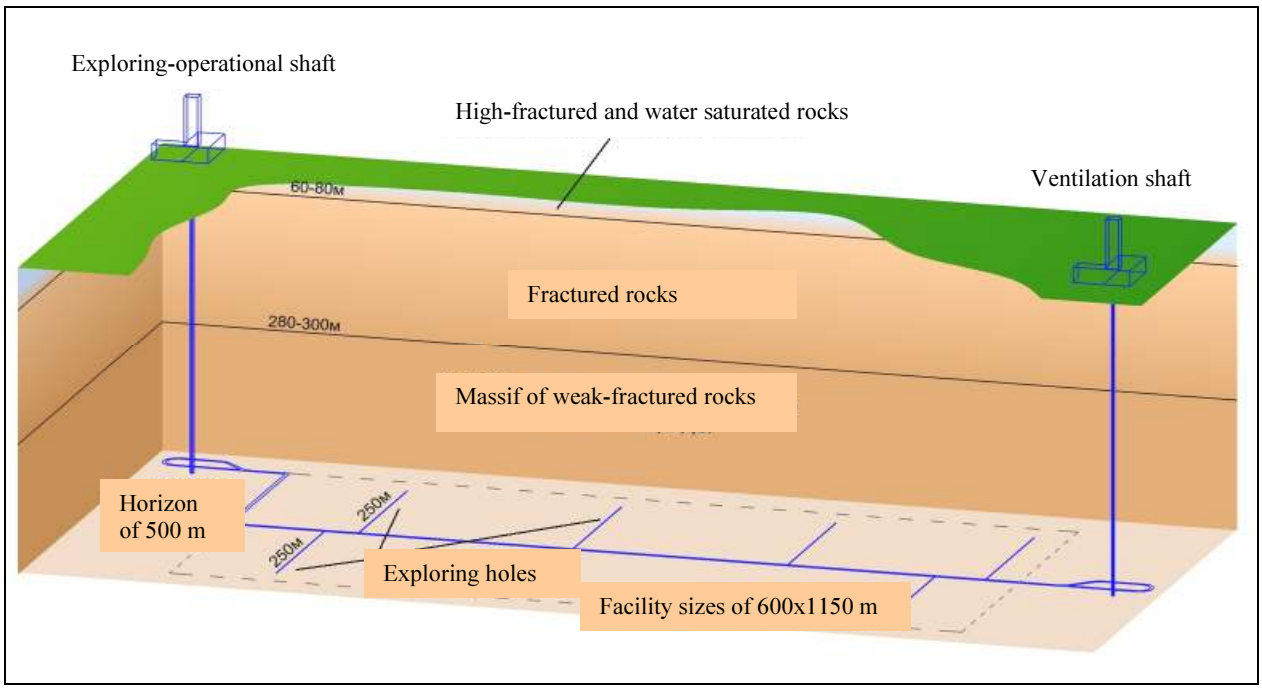

Figure 2. Scheme of Underground Laboratory

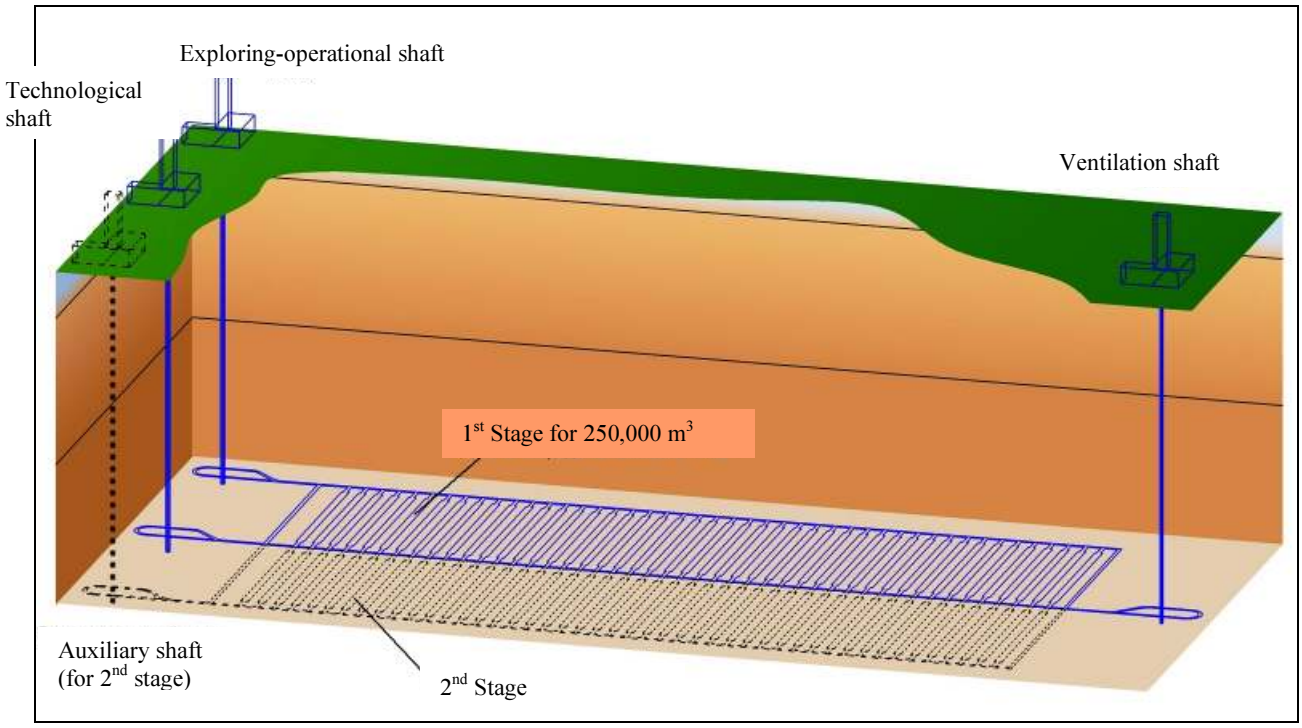

Figure 3. Scheme of First and Second Stages of RW disposal construction

Later activity of the First Stage should be fulfilled by income from operations (it means the payment for disposition of new container with RW). Specific income from disposal operations (see Table 10) of 1 m^3 of RW might be of 0.5 million rubles (in prices of 1st quarter of 2008) if annual volume amounts to 5,000m^3.

Because of disposal of long-lived waste with low heat release and activity the possibility is appeared to simplify requirements for elements of multi-barrier system, to provide effective using of

expensive deep underground space, to simplify technological operations of delivery of containers with RW.

Safe final isolation of long-lived solidified RW in deep geological disposal placed in weak permeable rock massif will permit as follows:

- not to impose burden of long-lived waste management thazardious within thousands of years to the next generations above long-lived waste
- guarantee necessary conditions for final dispose of solidified RW from the future SNF processing at MCC by innovation technology using;
- substantial improvement of ecological states of sites at MCC, SCC, PO "Mayak";
- exclusion of large costs that would be needed to keep stored long-lived RW for many centuries at the sites of mentioned Combines, including costs for repairing and upgrade of depositories, to ensure safety standards.

Conclusions

1. Federal Facility for final geological isolation of conditioned HLW and ILW contained long-lived radionuclides, including transuranium ones, is intended to be constructed into the rock massif of low permeability that is situated on the site «Yeniseysky», within ZATO Zheleznogorsk, Krasnoyarsk region. Total volume of disposed RW would be no less than 500,000 m^3.
2. Promising Subsite 37 was found for next additional investigations and, in possible, for underground RW disposal construction. Subsite 37 is placed on 4 km distance from MCC and on 4.5 km distance from river Yenisey. Depths of RW disposal are considered to be about 500 m; size of subsite is required to be about 1km^2.
3. From 2002 to 2005 the complex of geophysical investigations had been carried out on a surface of the site and three holes by the depth of 100 m and additional one of 600 m were drilled. The complex of geophysical and laboratory investigations had been fulfilled into the holes mentioned above. According to preliminary estimations the rock massif at the chosen subsite has appropriate properties to ensure safe isolation of RW.
4. According to Federal Standards, additional works have to be performed to confirm of appropriateness of the preliminary recommended Subsite 37 for full-scale facility construction, namely:

- complex of the necessary geological survey must be fulfilled at the surface;
- rock massif investigations in depths interval of 0-700 m and at the horizon of disposal chambers must be performed in the underground laboratory.

5. Federal Disposal for final geological isolation of long-lived radionuclides both with the future Plant for processing of light-water reactor SNF will be important objects of Common State System for management of SNF taking into prospects of considerable increase of Russian nuclear power industry.