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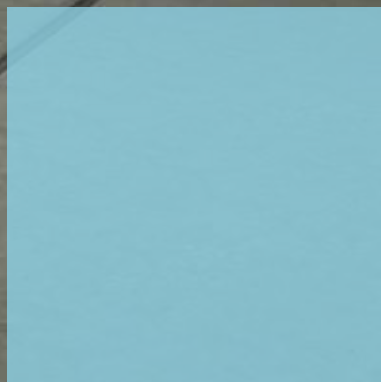
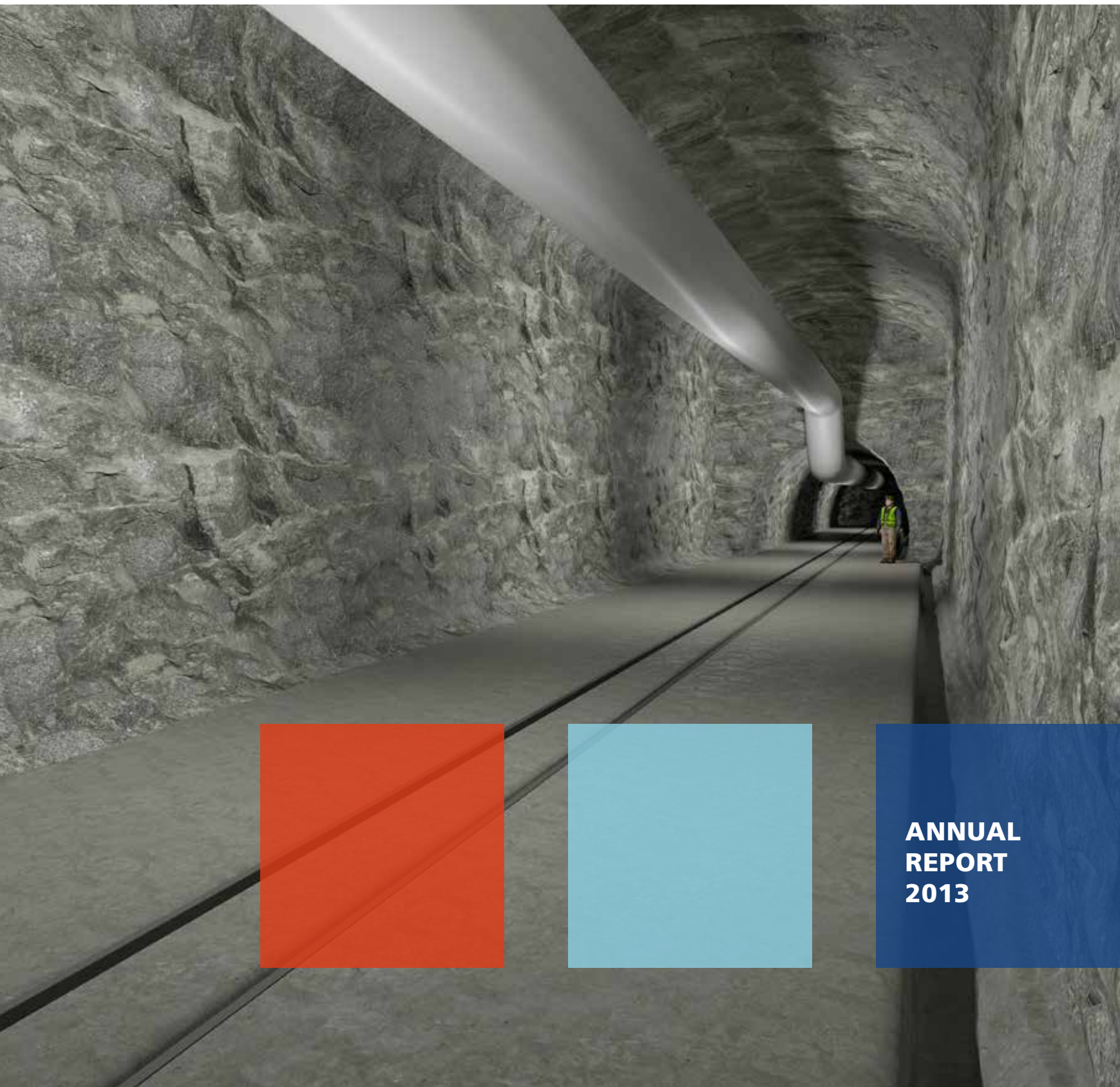
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**SÚRAO**

RADIOACTIVE  
WASTE REPOSITORY  
AUTHORITY



**ANNUAL  
REPORT  
2013**



## SÚRAO'S MISSION

The Radioactive Waste Repository Authority (SÚRAO) is a state organisation established under the provisions of Article 26 of Act 18/1997 on the peaceful uses of nuclear energy and ionising radiation (the Atomic Act) and on amendments to certain other Acts. SÚRAO's mission is to ensure the safe disposal of existing and future radioactive waste in compliance with the requirements of nuclear safety and human and environmental protection.

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**RNDr. Jiří Slovák**  
Managing Director

## MANAGING DIRECTOR'S INTRODUCTION

Dear friends, colleagues, ladies and gentlemen,

The Radioactive Waste Repository Authority (SÚRAO) has provided for the safe disposal of radioactive waste in the Czech Republic for sixteen years. We operate three repositories for the disposal of low-level and intermediate-level waste, are working on the preparatory stage of the future deep repository project and take an active part in the drawing up of strategic documents relating to the management of radioactive waste and spent nuclear fuel. We would like to bring you up to date via this Annual Report on both our activities and results achieved in 2013.

The operation of the Dukovany, Richard and Bratrství repositories and the disposal of low-level and intermediate-level radioactive waste at these repositories was undertaken in compliance with the relevant legislation and licences granted by the State Office for Nuclear Safety. Nuclear safety, radiation protection, physical protection, emergency preparedness and the maintenance of buildings, machinery and equipment were fully provided for at all times and at all operational repositories.

The testing of waste transport containers continued at the test laboratory and special work was carried out concerning the final stabilisation of waste disposal packages in disposal chambers K18 and K19 at the Richard repository.

SÚRAO continued to push ahead with the development of a deep repository for the disposal of high-level radioactive waste and spent nuclear fuel; work continued during the year on research and demonstration projects aimed at gathering information on repository feasibility and the long-term behaviour of the waste disposal system and the surrounding rock mass under various conditions as required for safety analysis purposes.

SÚRAO commenced the construction of the Bukov underground experimental facility situated near the Bukov mine complex on level 12 of the Rožná I uranium mine which will be used for acquiring "in situ" arguments, data and characteristics for the safety assessment of the future deep repository. A conventional method is being employed for excavation purposes using blasting so as to disrupt the rock mass as little as possible and to ensure the best possible conditions for future research work.

In 2013 we commenced, in cooperation with the Centre for Experimental Geotechnics at the Czech Technical University in Prague (CEG ČVUT) and ÚJV Řež, our active involvement in the DOPAS research project concerned with the construction of experimental sealing plugs in deep repositories.

## **“ We continued to operate our radioactive waste repositories safely and in compliance with international standards. ”**

A further important ongoing research project involves the development of a waste disposal container. Work began in 2013 on the project, the results of which will consist of a proposal of the materials for and the structural design of a waste disposal container for spent nuclear fuel. The container must meet all the relevant criteria in terms of required lifetime and safety.

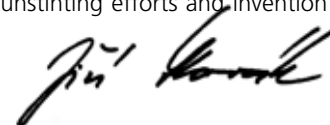
One of the important aspects of our work is to ensure the understanding of both the professional and general public. In addition to research projects, special excursions are organised on a regular basis for inhabitants of DGR candidate local communities to the Richard repository and the Josef underground research laboratory. An excursion was organised once again in 2013 to a foreign disposal facility, this time to that of NAGRA, the Swiss national agency responsible for the preparation and implementation of the safe disposal of all types of radioactive waste produced in Switzerland. We also continued to provide information to all citizens in the candidate localities concerned via information leaflets and the “News from SÚRAO” newsletter.

We take an active part in various international projects and activities. The closing conference of the international IPPA (Implementing Public Participation Approaches in Radioactive Waste Disposal) project was held in Prague at the end of September / beginning of October 2013 which was followed by a meeting of the Exchange Forum of the IGD-TP (Implementing Geological Disposal – Technology Platform) in October. Both events were attended by more than a hundred guests from a total of 18 countries who discussed ways in which to introduce theories of public participation into practice (IPPA) as well as the orientation and priorities of joint research and development in the field of radioactive waste disposal financed by the European Commission.

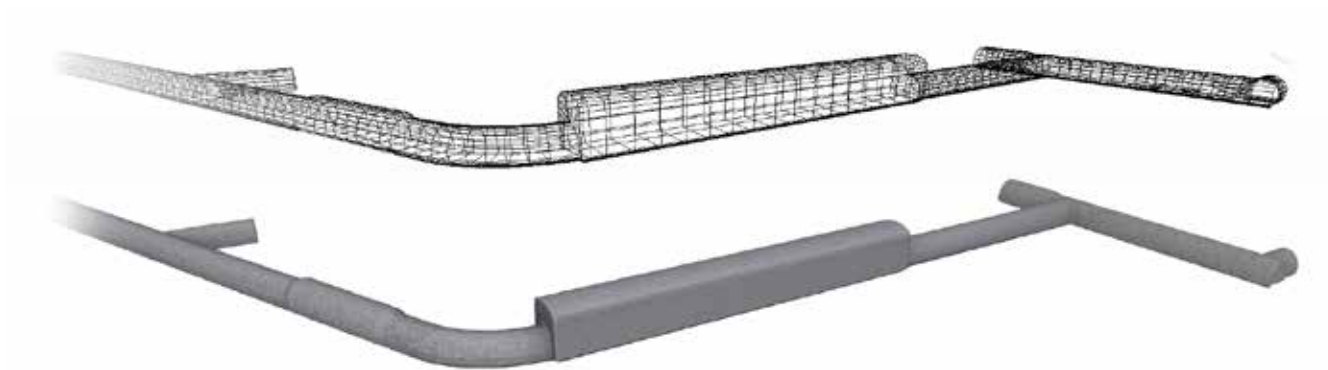
Concerning site selection for the future deep repository, further preparations were made in 2013 for the commencement of geological investigation work. Applications were submitted for the identification of investigation areas for intrusion into the Earth’s crust at all 7 candidate localities. As of 2013, the identification of investigation areas forms only the first stage in terms of geological investigation work for site selection purposes. Communication therefore focused on the reasoning behind the modification of the strategy concerning the site selection process. We have always been and continue to be committed to communicating with the communities concerned in an open and transparent manner. We feel that the new site selection process will prove more efficient in terms of achieving our goals and lead ultimately to the fulfilment of our obligations ensuing from relevant Government Decisions and the Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic.

As in previous years, the Radioactive Waste Repository Authority successfully fulfilled its mission in 2013. We continued to operate our radioactive waste repositories safely and in compliance with international standards and, in cooperation with leading Czech experts and foreign colleagues, we continue to closely follow the latest research and development trends in the field of radioactive waste management.

It is my pleasure once again to express my thanks to all SÚRAO’s employees without the unstinting efforts and invention of whom we would not have been able to achieve such highly satisfactory results. Thank you.



# URF BUKOV



A project for the construction of the URF Bukov underground research facility within the Rožná uranium mine complex was launched in 2013. The facility will be used for the research of, and data collection from crystalline rocks (geological, structural-tectonic, geotechnical and hydrogeological) at depths similar to those envisaged for the future repository. The following research stage will involve the acquisition of data to be used for the verification of structural-geological, geochemical and hydrological models.









# CURRENT SITUATION IN RADIOACTIVE WASTE MANAGEMENT

Short-lived low-level and intermediate-level waste makes up the largest category of radioactive waste in terms of volume. This type of waste, liquid or solid, is generated during the operation and decommissioning of nuclear reactors and when dealing with ionising radiation sources and ceases to be radioactive after a few hundred years and, therefore, can be disposed of in near-surface repositories. The technology for the processing and conditioning of such radioactive waste prior to its disposal is well-established and is implemented in the Czech Republic.

Short-lived low-level and intermediate-level waste generated at nuclear power plants is stored at a surface disposal facility located at the Dukovany NPP site. The facility's total disposal capacity of 55 000m<sup>3</sup> (around 180,000 drums of 200 litres each) is able to accommodate all the waste that it is estimated will be generated at the Dukovany and Temelín NPPs provided that the waste meets acceptability criteria, as well as short-lived low-level and intermediate-level waste to be stored following the decommissioning of both nuclear power plants. In addition, this disposal facility is partly used for the disposal of institutional waste. Short-lived low-level and intermediate-level waste generated by the industry, research and medical sectors is disposed of at the Richard (near Litoměřice) and Bratrství (near Jáchymov) repositories.

The Richard repository was constructed on the site of the former Richard II limestone quarry (underground, beneath the Bídnice hill). Institutional waste has been disposed of at this site since 1964. The total volume of this underground facility exceeds 17,000m<sup>3</sup>, the disposal capacity making up approximately half that volume (the remainder being service corridors).

The Bratrství repository is designed for the disposal of waste containing naturally occurring radionuclides. It was constructed in one of the mined cavities of a former uranium mine and contains five chambers with an overall capacity of approximately 1,200m<sup>3</sup>. The facility was put into operation in 1974.

The operation of all Czech repositories including the monitoring of the now-closed Hostim repository is managed by SÚRAO in compliance with relevant licences granted by the State Office for Nuclear Safety (SÚJB) and, in the case of mined cavities, in compliance with permits and licences issued in accordance with mining regulations. The capacity of the Dukovany repository provides enough space for waste disposal for the next several decades whilst that of the Richard repository might be fully utilised by 2018 depending on the real volume of waste to be disposed of at the facility issuing from environmental damage caused by the activities of ÚJV Řež. It will be possible to expand the disposal capacity of the repository should it be required by adapting unused space and communication corridors within the repository for disposal purposes, following which its capacity will suffice at least until 2030. It is anticipated that the capacity of the Bratrství repository will be fully utilised shortly after 2020. SÚRAO plans to gradually close the repository, following which the capacity required for the disposal of waste containing naturally occurring radionuclides will be provided at the Richard repository.

A certain amount of long-lived low-level and intermediate-level waste is also generated which cannot be disposed of in existing near-surface facilities. For this type of waste, special requirements are in place concerning the method and quality of conditioning necessary for its storage and subsequent disposal in a deep geological repository. This waste is currently stored either by waste producers or by SÚRAO.

High-level waste and spent nuclear fuel, classed as waste, will be disposed of in a future deep geological repository. Until such time as the deep geological repository comes into operation, this waste will be stored by its producers who can decide on its potential further use.

## **OPERATION OF THE DUKOVANY REPOSITORY**

The Dukovany repository is operated by SÚRAO through ČEZ, the Czech power company, on a contractual basis (in accordance with the Atomic Act, Article 26). The acceptance of waste to be disposed of at this repository and certain other responsibilities, such as inspection, are carried out directly by SÚRAO in compliance with operating regulation P147j, limits and conditions for the safe operation of the Dukovany repository and other documents issued by SÚRAO or ČEZ, the contractor.

Normal repository operation during the year included an inspection of buildings and equipment, the maintenance of buildings, land, machinery and electrical equipment, radiation protection, physical protection, emergency preparedness and nuclear safety.

In 2013, the repository accepted 1,774 radioactive waste disposal packages, of which 1,705 metal 200-litre drums, 61 storage pallets and 8 pieces of solid waste. Waste disposal packages were placed in vaults D12 and D06.

The Dukovany nuclear power plant delivered for disposal a total of 987 waste disposal packages of bituminised waste, 150 disposal packages of unstabilised waste (of which 6 pallets and 148 metal 200-litre drums) and 216 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix. 672 packages of bituminised waste, 146 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix and 81 disposal packages of unstabilised waste (of which 6 pallets and 75 metal 200-litre drums) were placed in vault D12. 315 packages of bituminised waste, 70 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix and 73 packages of unstabilised waste were placed in vault D06.

The Temelín NPP delivered for disposal 158 waste packages of bituminised waste, 27 waste packages of unstabilised waste (of which 14 metal 200-litre drums and 13 storage pallets containing bulky lump waste) and 25 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix. 118 packages of bituminised waste, 16 packages of unstabilised waste (of which 13 pallets and 3 metal 200-litre drums) and 5 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix were placed in vault D12. 40 packages of bituminised waste, 20 waste disposal packages of used ion exchangers solidified into an aluminosilicate matrix and 11 packages of unstabilised waste were placed in vault D06.

The Nuclear Research Institute Řež (ÚJV Řež) delivered for disposal 207 waste packages, of which 25 metal 200-litre drums of unsolidified waste, 42 storage pallets containing unstabilised bulky lump waste and 8 pieces of unpacked waste were placed in vault D12; 132 metal 200-litre drums containing solidified waste were placed in vault D06.

The monitoring of the repository and the surrounding areas was performed in accordance with the approved monitoring programme; no breach of the limits and conditions for the safe operation of the Dukovany repository were detected. Four inspections were conducted by the SÚJB at the Dukovany repository during 2013; no serious breaches were discovered during three of these inspections. An inspection at RC Brno assessed the hierarchy of the systematic supervision of radiation protection and recommended partial modifications in order to ensure a higher level of interconnection between the activities of SÚRAO and those of the supplier.



## **OPERATION OF THE RICHARD AND BRATRSTVÍ REPOSITORIES**

Both the Richard and Bratrství repositories were operated by SÚRAO during 2013 in compliance with the relevant licences issued by the State Office for Nuclear Safety (SÚJB) and the Czech Mining Authority (ČBÚ). Normal operation of both repositories covered the inspection of the mined cavities, the maintenance of buildings and equipment, machinery, electrical fittings and land. SÚRAO was also responsible, in accordance with the relevant SÚJB licences, for the physical protection, radiation protection, emergency preparedness and nuclear safety of these repositories.

In 2013, 342 waste packages (68.4m<sup>3</sup>) were disposed of at the Richard repository with a total mass of 112t. A further 15 packages of radioactive waste were accepted at this repository with a total mass of 0.686t. 58 waste packages were disposed of at the Bratrství repository with a total capacity of 11.6m<sup>3</sup> and a mass of 31.3t.

The geotechnical and hydrogeological parameters of the Richard and Bratrství repositories were monitored regularly throughout the year. Both facilities were operated in compliance with the relevant statutory safety requirements and legal regulations. Radiation monitoring of the repositories and surrounding areas was carried out in accordance with approved monitoring programmes. SÚRAO's performance was supervised during 2013 by the SÚJB (four inspections at the Richard repository and two inspections at the Bratrství repository) and the relevant mining supervisory bodies. Both repositories were declared as being under safe operation according to national legislation.

The Richard repository is currently being used for the temporary management of certain defined radioactive waste (according to an SÚJB Decision issued in compliance with the Atomic Act, Article 26, paragraphs 3j and 3k and Article 31, paragraph 4).

## **LABORATORY FOR WASTE CONTAINER TESTING**

The test laboratory at the Richard repository is used to test containers designed for the transport, storage and disposal of nuclear material and radioactive emitters (with a mass of up to 3,200kg) as well as to test radioactive substances of special form. One B(U) type transport container and one A type container were tested during 2013. In addition, a partial drop test was carried out and the validity of one certificate extended.

The laboratory also provided consultancy services to container users and manufacturers throughout the year. The laboratory's total income for 2013 amounted to CZK 199.3 thousand.

# LICENCING AND RADIATION PROTECTION

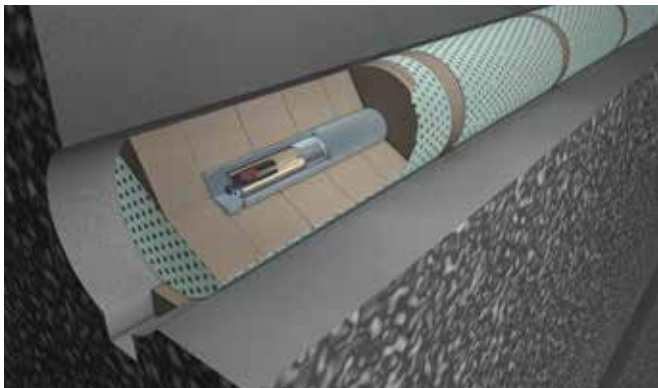
The main aim of activities related to the licensing procedure and radiation protection is to ensure repository operation and radioactive waste management compliance with the provisions of the Atomic Act and relevant Regulations, primarily SÚJB Regulation 307/2002 on radiation protection.

The licensing procedure for the Richard, Bratrství and Dukovany repositories is carried out every five years unless the SÚJB decides otherwise or unless no changes occur in repository operation or in the properties of waste disposed of which might have an impact on the fulfilment of radiation protection requirements. The basic documentation required for the licensing procedure is prepared in compliance with the Atomic Act. The safety report makes up the basic document which proves the safety of the repository in terms of the staff employed at the facility, the general public and the environment. The scope of the safety report is specified in methodological instructions issued by the SÚJB and based on recommendations from the International Atomic Energy Agency (IAEA) in Vienna. The radiation burden of staff members, the public and the environment is assessed using regularly verified procedures and as part of a number of international programmes. Computing tools and computer programs used for safety analysis purposes have been standardised by an SÚJB commission and are used to determine the consequences of potential radionuclide migration from repositories.

Repository safety is ensured if set limits and criteria for the safe operation of such facilities and/or the safe management of radioactive waste, based on the results of safety analysis and approved by the SÚJB, are observed. The observance of set limits and criteria for the safe operation of repositories means that requirements relating to the radiation protection of staff members, the public and the environment are fulfilled.

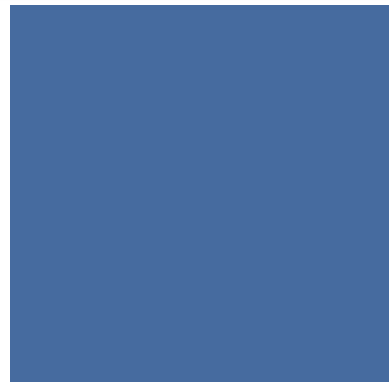
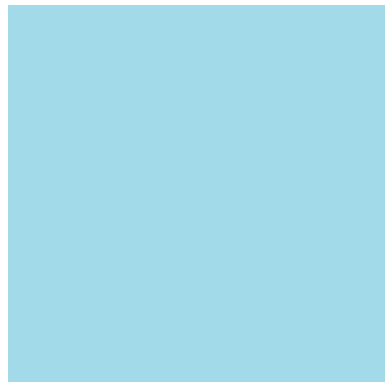
Radiation protection activities make up one element of the system for the protection of persons and the environment against the detrimental impact of ionising radiation the main reason behind which is to prevent the release of radionuclides into the environment and the occurrence of emergency situations. A specially-designed system made up of a range of technical and organisational measures is used for this purpose. The risk of danger to human life and health and the environment must be kept as low as possible with reasonable consideration for the economic and social aspects involved. The maximum acceptable level of risk corresponds to dose limits defined by SÚJB Regulation 307/2002 on radiation protection.

# WASTE DISPOSAL CONTAINER



The aim of the project is the development of a waste disposal container for spent nuclear fuel produced by Czech nuclear power plants. The materials and structural design employed must be able to ensure the required level of safety under deep repository conditions for at least 10 000 years and, at the same time, meet strict requirements in terms of both operational and long-term safety. The high-level waste deep disposal project is based on the multi-barrier safety concept according to which the waste disposal container makes up the most important of a series of engineered barriers.







SÚRAO operates its repositories and performs the relevant support activities in compliance with SÚJB licences issued in accordance with the Atomic Act. Additional relevant documentation required for SÚRAO to operate its repositories has been approved (the licence for the Dukovany repository is effective until 15 December 2017, for the Richard repository until 31 December 2018 and for the Bratrství repository until 15 December 2018).

In December 2013, SÚRAO obtained a licence for radioactive waste management at the Bratrství repository and a licence for the operation of this repository, a category IV facility.

The fulfilment of requirements relating to radiation protection (as defined by Regulation 307/2002) has been verified during the monitoring of currently operational repositories as well as at the now-closed Hostim repository. Individual dosimetry of SÚRAO's employees was provided, the health, expertise and skills of A and B category repository staff were verified and the inventory of individual doses received by SÚRAO staff members as well as SÚRAO-owned radiation sources updated. No radiation protection breach occurred during the year. SÚRAO cooperated closely with outside contractors working at its repositories in terms of organising training courses and regular safety inspections.

Concerning statutory requirements for radiation protection, SÚRAO co-operated closely with the SÚJB during their facility inspections and supervised the subsequent correction of any deficiencies identified relating to the observance of set limits, criteria for the safe operation of repositories, radioactive waste management and radiation protection. Requirements defined in SÚJB Regulation 318/2002 on emergency preparedness were satisfied and appropriate measures aimed at correcting any deficiencies identified relating to emergency preparedness were implemented.

**“ The scope of the safety report is specified in methodological instructions issued by the SÚJB and based on recommendations from the International Atomic Energy Agency (IAEA) in Vienna. ”**

# MINING SAFETY

The operation of the Richard and Bratrství underground repositories is authorised based on licences which allow “specific encroachment into the Earth’s crust” issued in compliance with the Mining Act and certain other licences issued in compliance with the Mining Operations Act.

Both repositories were operated throughout the year in compliance with relevant legal regulations and licences issued by the Czech Mining Administration and the SÚJB as well as various internal operational regulations, limits and conditions.

In 2013 SÚRAO commenced the implementation of the Bukov Underground Research Facility (PVP Bukov) project. The facility is situated near the Bukov mine complex on level 12 of the Rožná I uranium mine. The conventional blasting method was used during excavation work. Due to PVP Bukov’s status as a future research facility, particular attention was devoted to the quality and evenness of the excavation work.

SÚRAO, in cooperation with the Centre for Experimental Geotechnics at the Czech Technical University in Prague (CEG ČVUT) and ÚJV Řež, commenced joint involvement in the DOPAS research project concerned with the construction of experimental sealing plugs in deep repositories. A specially designed pressure plug will be constructed at the Josef Underground Research Centre and gradually exposed to pressures of up to 7MPa. Related work and compliance with mining regulations were monitored on a continuous basis.

Specialised work concerning the final stabilisation of disposal containers with radioactive waste in chambers K18 and K19 was carried out at the Richard repository during the year. A comprehensive inspection of all the machinery and technical equipment involved as required by mining legislation, in particular Regulation 22/1989 on mining health and safety, was performed prior to project commencement. The technological process employed, which was approved by the mines manager, and the operational documentation, including that covering risk assessment for work conducted by employees from a number of organisations in one workplace were prepared by the contractor, and workers from both organisations were fully acquainted with all the relevant documentation. The time spent by each worker at individual locations within the repository was monitored and recorded and the impact of the inhalation of radon and long-term alpha activity evaluated by the relevant authorised institution throughout the implementation stage.

Emergency preparedness exercises relating to the coordination of occupational safety were held throughout the year at both the Richard and Bratrství repositories in accordance with the Emergency Plan issued by the mines manager and in conjunction with the Principal Mining First Aid Station in Most. All those repository employees involved in radioactive waste management were required to take part in the exercises which proved that all the units involved were well prepared to solve any emergency situations which might arise.

Compliance with requirements for radiation protection and mining safety were verified during the year, as required by Act 61/1988, by the Czech Mining Authority via the relevant Regional Mining Authorities in Most and Sokolov and the State Office for Nuclear Safety (SÚJB). Inspections performed at both repositories during the year showed that the operation of the underground facilities was in full compliance with mining legislation and all the relevant measures and decisions concerning the safe operation of both repositories were fulfilled.



# MAINTAINING AN INVENTORY OF ACCEPTED RADIOACTIVE WASTE AND NUCLEAR MATERIAL

SÚRAO is responsible (according to the Atomic Act, Article 26, paragraph 3d) for maintaining an inventory of accepted radioactive waste and its producers. Detailed rules for maintaining such an inventory are set out in Regulation 307/2002. Records of accepted radioactive waste are maintained by SÚRAO both in paper and electronic form.

SÚRAO holds an SÚJB licence for the management of category II nuclear material. An inventory of nuclear material is maintained in compliance with SÚJB Regulation 316/2002 and EU Regulation 302/2005. Nuclear materials are stored at the Richard repository at which the appropriate physical protection level is ensured as required by SÚJB Regulation 144/1997.

SÚRAO submits to the European Commission, on a monthly basis, reports on the amount of radioactive materials disposed of and copies of these reports are submitted to the SÚJB. A total of 197 items of nuclear material had been recorded by 31 December 2013.

**“ SÚRAO submits to the European Commission, on a monthly basis, reports on the amount of radioactive materials disposed of and copies of these reports are submitted to the SÚJB. ”**

# ADMINISTRATION OF NUCLEAR ACCOUNT FUNDS

The administration of Nuclear Account funds was governed in 2013 by the Atomic Act, Article 27, Government Decree 416/2002, on the scale of charges and manner of payment by radioactive waste producers to the Nuclear Account and on annual contributions to local communities, and Act 280/2009 (the Tax Code). Detailed records were kept on individual contributors to the Nuclear Account (in compliance with Government Decree 416/2002, Article 3).

## **PAYMENTS BY PRODUCERS OF RADIOACTIVE WASTE FROM NUCLEAR REACTORS**

Pursuant to Government Decree 416/2002, Article 1, ČEZ contributed in 2013 CZK 1,537,266,000 while the yearly contribution made by Research Centre Řež, a ÚJV Řež subsidiary, amounted to CZK 747,600. Both amounts were paid in regular monthly instalments which were made directly to the Nuclear Account.

## **PAYMENTS BY OTHER PRODUCERS OF RADIOACTIVE WASTE**

Other waste producers, as specified in Article 2 of Government Decree 416/2002, paid their charges following acceptance of their waste for disposal by SÚRAO. Payment notices were issued to each waste producer (based on a contract between SÚRAO and the respective waste producer) upon acceptance of the radioactive waste accompanied by the relevant waste acceptance documentation. The total sum paid in 2013 amounted to CZK 17,937,400.

Disposable funds in the Nuclear Account were invested by the Ministry of Finance in the financial market (in compliance with the Atomic Act, Article 27). Revenue received from financial investment totalled CZK 578.5 million.

## **AUDITING LICENSEES' DECOMMISSIONING RESERVES**

SÚRAO is responsible (according to the Atomic Act, Article 26, paragraph 3h) for ensuring, by means of an audit, that relevant licence holders honour their obligation (Atomic Act, Article 18, paragraph 1h) to create financial reserves for the future decommissioning of their facilities.

Audits were conducted in 2013 at 13 organisations comprising a total of 33 facilities which met the following conditions:

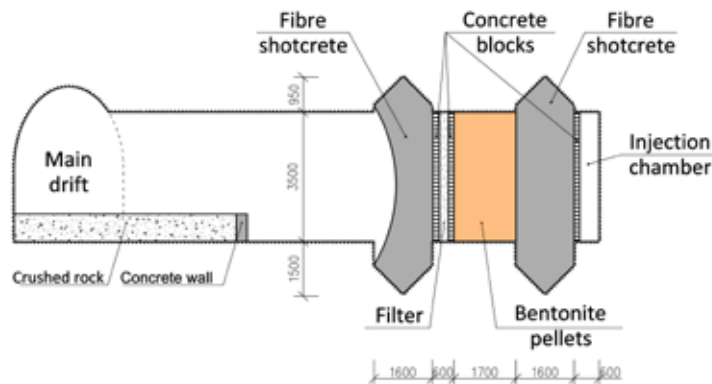
- the organisation concerned is obliged to accumulate decommissioning reserves in compliance with the amended Atomic Act (Act 13/2002);
- the organisation is in possession of a certificate verifying its decommissioning cost estimate;
- the verified decommissioning cost estimate exceeds CZK 300,000.

Audits aimed at verifying the accumulation of financial reserves were conducted under the same rules as in the previous year. Audits were performed in cooperation with the respective licence holders and requests by SÚRAO for supplementary documentation were duly met. Records of audits performed of individual licence holders were drawn up containing audit results, the amount of accounting reserves and the amount of funds deposited in special escrow bank accounts including a review of the development of the accumulation of financial reserves.

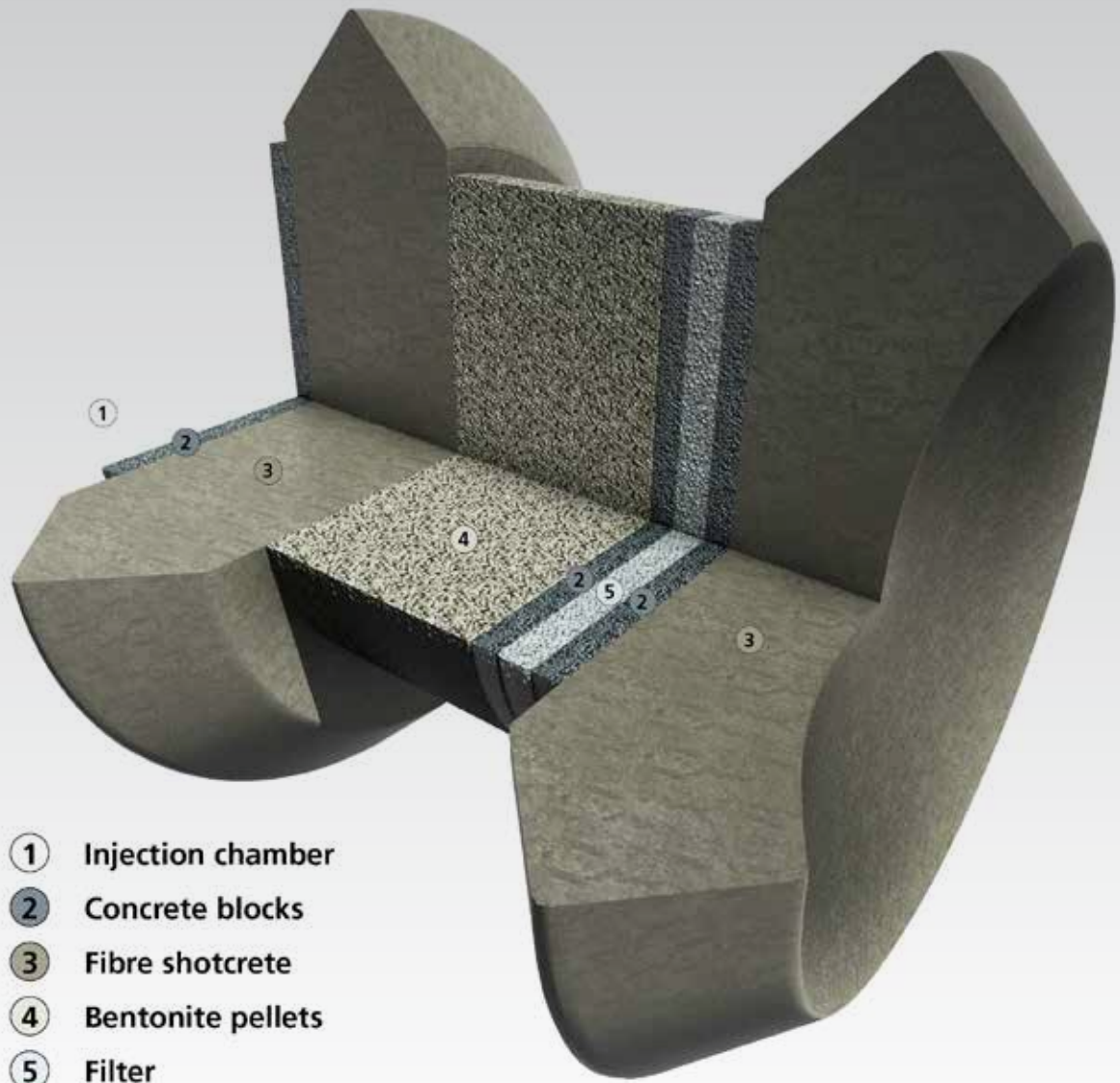
A summary report on audits performed in 2013 to verify the creation of financial reserves for the future decommissioning of nuclear plants and other nuclear facilities was duly prepared and presented to SÚRAO's Board and subsequently to the SÚJB in accordance with SÚRAO Statutes.



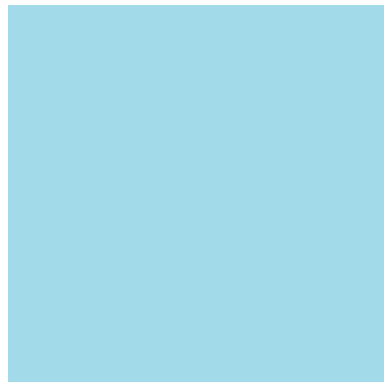
# DOPAS



The DOPAS project is a pilot project designed by the IGD-TP technological platform involving the participation of a consortium of 13 partners from 8 European countries. The Czech in-situ EPSP experiment is being conducted by a consortium consisting of SÚRAO, ČVUT Prague and ÚJV Řež at the Josef underground research laboratory. The project is concerned with the process surrounding the closure of deep repositories, the design and construction of deep repository sealing plugs and the study of a wide range of processes which it is anticipated will occur within the engineered barriers following SNF disposal. The results of the experiment will be used to demonstrate the feasibility of sealing materials available in the Czech Republic as well as to provide the data required for the assessment and verification of repository safety.



- ① Injection chamber
- ② Concrete blocks
- ③ Fibre shotcrete
- ④ Bentonite pellets
- ⑤ Filter





# DEVELOPMENT OF A DEEP GEOLOGICAL REPOSITORY

The “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic” stipulates that radioactive waste and spent nuclear fuel classed as waste be finally disposed of in a deep geological repository. The construction of such a repository in the Czech Republic is envisaged. Safety will be ensured by means of a system of both engineered and natural (geological) barriers which can isolate radionuclides contained in the waste from the environment until their concentration is reduced to a level which does not pose any risk to any component of the biosphere. Various potential options for the design of the repository are set out in the reference project for a Deep Geological Repository available on SÚRAO’s website ([www.surao.cz](http://www.surao.cz)).

## SITE SELECTION

Potentially suitable sites for deep repository construction were selected by the Czech Geological Institute in 1992. Following a further assessment of deep repository candidate sites in terms of both excluding and prerequisite criteria set out in SÚJB Regulation 215/1997 and further relevant legislation (e.g. the Conservation of Nature and Landscape Act), 11 potentially suitable sites situated in three different rock types were identified from which SÚRAO subsequently selected 6 sites situated in stable granite formations. Following the completion of this phase of the selection process, geological work commenced at the sites in the second half of 2003 with the aim of collecting more detailed geological data in order to reduce the surface area of each candidate site. Work carried out before 2004 was considered geological research (in terms of Act 62/1988, on geological work practices). An evaluation of the work performed was completed in 2005.

However, in view of the overwhelmingly negative public attitude to the project, SÚRAO, following agreement with the Ministry of Industry and Trade, suspended all geological work at the sites until 2009 (the Government, by means of Decision No. 550 of 2 June 2004, accepted the suspension).

Consequently, sites were searched for with potentially more favourable public attitudes to the project. The investigation of former military areas was launched by SÚRAO at the end of 2008 in compliance with its plan of activities approved by the Government (Government Decision No. 1315 of 20 October 2008). The Boletice former military area was assessed in particular detail. In addition, an area close to a currently operational uranium mine at Dolní Rožínka (Kráví hora) was added to the list of candidate sites.

Any decision on repository siting in a certain locality will involve detailed geological investigation work which must be preceded by a decision on the identification of specific investigation areas. Consequently, in 2013 applications for the identification of investigation areas in all six originally selected locations as well as the Kraví hora site were submitted for the first investigation stage, the aim of which is to reduce the number of candidate sites prior to the next stage which will involve deep borehole drilling. Based on the information gathered, geological, hydrogeological, geochemical, geomechanical and other models will be constructed for all the sites followed by the conducting of safety analysis and feasibility studies.

The decision-making process surrounding suitability for the siting of a deep repository will take into account the potential impacts of the repository on the environment and will include a detailed socio-economic analysis of the impact of repository construction and operation on community development plans and the standard of living of local people.

Assignment documentation for the “Geological investigation of localities for intrusion into the Earth’s crust for radioactive waste disposal in underground facilities in the site selection stage” was prepared in 2013. Geological investigation will be carried out in three stages. The first stage will consist of non-intrusive surface geological investigation (employing solely non-invasive methods) the aim of which will be to verify fault and fracture structures in the rock environment by means of geological mapping and geophysical experimentation and the acquisition of knowledge of the hydrogeological situation at the locality concerned employing existing data. In addition, refining criteria for deep repository siting were defined in 2013.

SÚRAO prepared during the year a proposal for a research study involving the assessment of the wider surrounding areas of the Czech Republic’s two nuclear power stations (each area covering more than 200km<sup>2</sup>). In addition, a preliminary project assignment entitled “The Assessment of Geological and other Information on Selected Parts of the Czech Moldanubicum in Terms of Potential Suitability for DGR Siting” was released at the end of 2013.

## **DESIGN ACTIVITIES**

The technical design of the repository including an estimate of the costs involved in construction and operation is contained in the Reference Project for a Deep Geological Repository (DGR) according to which the waste disposal container forms one of the engineered barriers. In this context work commenced in 2013 on a project concerning the materials to be used for, and the structural design of a waste disposal container for spent nuclear fuel; crucially, the container must meet all the relevant criteria in terms of required lifetime and safety.

A project for the construction of the PVP Bukov underground facility within the Rožná uranium mine complex was launched in 2013. The facility will be used for the research of, and data collection from crystalline rocks (geological, structural-tectonic, geotechnical and hydrogeological) at depths similar to those envisaged for the future repository. The following research stage will involve the acquisition of data to be used for the verification of structural-geological, geochemical and hydrological models.

The “Mock-up Josef” project, concerned with the verification of engineered barriers, has been underway since 2010 at the Josef Underground Research Facility near Chotilsko in the Příbram region. The aim of the project is to research in detail the properties and behaviour of bentonite barriers in deep repositories. The project involved the construction of a realistic model of a supercontainer which was emplaced in a disposal well sunk in part of the Josef underground facility at the end of 2012; data collection commenced in January 2013.



# RESEARCH AND DEVELOPMENT RELATING TO ENGINEERED BARRIERS AND NEAR- AND FAR-FIELD PROCESSES

A detailed research and development programme for the period to 2025 was drawn up in 2013 concerned with obtaining the information required for the assessment of the safety of repositories at selected localities as a result of which assignment documentation for a project entitled “Research Support for the Assessment of Deep Repository Safety” was prepared. The objective of the project, to be launched in August 2014 and scheduled for completion in 2018, is to prepare models and gather data, information and further arguments supporting a subsequent study which will assess the long-term safety of repository siting at all the potential localities. The main part of the project will consist of the development of 3D structural-geological and hydrogeological models for all the selected sites which will form the basis for the safety assessment of repository siting at potential localities. Information obtained from the models will enhance geological investigation work at the localities concerned and assist in determining the positioning of the deep boreholes which are planned for the following stage of geological investigation. The project will also provide the information required for the refinement of data on the properties of spent nuclear fuel and radioactive waste, on the long-term stability of engineered barriers and the migration parameters of the rock environment.

Research work connected with the “Tunnel 2011” project is being carried out in the context of the study of the long-term behaviour of rock masses. In addition to the ongoing monitoring of selected physicochemical properties, the project focused on the development of an automatic data collection system during the year. In addition, a web application which enables the interactive visualisation of the tunnel, primarily the measurement techniques and interpretation methods employed, was developed outside the scope of the project proper. The application represents a pilot project which will allow on-line access to selected measurement methods during the characterisation stage of potential localities for deep repository siting in order to improve the awareness of the general public concerned.

## INTERNATIONAL PROJECTS

International cooperation is of particular importance in terms of research and development concerned with deep repositories and a number of countries (e.g. Sweden, Finland, France and Switzerland) are well advanced in this respect. Consequently, joint research activities at the bilateral and international levels and the use of common resources and knowledge, principally linked with European research and development framework programmes, provide results much more quickly than single-country research programmes. Particularly important in this respect was the creation of the IGD-TP (Implementing Geological Disposal – Technology Platform) technological platform which identified strategic priority research and development topics for the forthcoming time period which will include the implementation of the EU’s first deep repositories planned for 2025 (Sweden, Finland and France) and concerning which the DOPAS project, an IGD-TP technological platform pilot project which is being conducted by a consortium made up of ANDRA/Nagra, Posiva, SKB, SÚRAO/ČVUT/ÚJV, NDA and GRS/DBE and coordinated by Posiva (Finland), is of primary importance. The Czech partners in the DOPAS project will conduct experiments at the Josef underground facility and ÚJV Řež laboratories. The project involves the design and construction of deep repository sealing plugs and the study of a wide range of processes which will occur within the engineered barriers following SNF disposal and will provide the data required for the assessment and verification



of repository safety as well as demonstrate the feasibility of the use of sealing materials available in the Czech Republic (Rokle type bentonites). The project was launched successfully and currently grouting work is underway in a specially-selected part of the Josef underground complex (contractor - ARCADIS). Experimental work is also being performed concurrently by ÚJV Řež and ČVUT/CEG. It is planned that the project will reach completion in 2016.

The CAST project which is concerned with the behaviour of carbon-14, one of a group of critical radionuclides, under repository conditions is supported by the European Commission and SÚRAO specialists continue to be involved in the PETRUS III project concerned with the education of young specialists in the field of radioactive waste disposal.

In addition, Czech specialists are involved in projects organised by the IAEA and NEA-OECD with the participation of non-EU countries including the USA, Canada, Japan, South Korea, China and Switzerland. Very valuable results are obtained e.g. from joint experiments conducted at foreign underground laboratories (e.g. the Grimsel laboratory in Switzerland) the main objectives of which are to gain an understanding of the processes at work in deep radioactive waste repositories situated in crystalline rocks and to gather data for safety analysis purposes. The LTD – Long Term Diffusion - experiment, concerned with the retardation of the transport of radionuclides via rock fractures into the crystalline rock matrix, is a globally unique experiment involving the study of radionuclide behaviour in the natural environment. A further two projects are currently in the preparation stage one of which will be concerned with the long-term monitoring of structural-tectonic changes in a crystalline rock massif over a set time period and the potential impact on the long-term stability of the massif (the LASMO – Large Scale Monitoring – experiment). The second experiment will involve the long-term assessment of the speed of and mechanisms surrounding the corrosion of materials used in the construction of SNF containers which make up the first barrier against radionuclide release in deep repositories (the MaCoTe – Material Corrosion Test – experiment). The aim of SÚRAO's involvement in these experiments is to gain the knowledge and experience required for the performance of similar experiments in the Czech Republic.

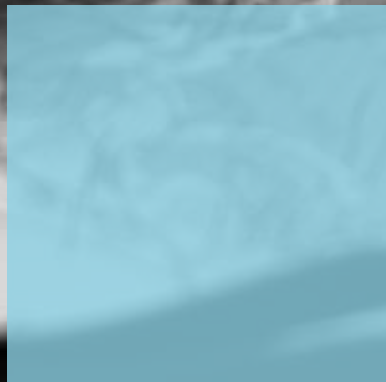
The EBS Task force – stage II joint international research project continues with the involvement of the Technical University (TU) in Liberec and ÚJV Řež. The project is focused on modelling and experimentation concerned with the long-term stability of bentonites in the buffer layer. The project is being coordinated by SKB.

The Decovalex D2011 international project was concluded last year with the project final assessment. The international project team included specialists from TU in Liberec and the Institute of Geonics of the Czech Academy of Sciences in Ostrava. The follow-up D2015 project was subsequently launched with the objective of validating the robustness of development tools used in the modelling of near-field processes and rock fracture zones, and to develop tools for the modelling of related processes which are expected to occur in deep repositories.

# GEOLOGICAL INVESTIGATION



Geological investigation will be carried out in three stages. The aim of the first stage will be to verify the integrity and intactness of the selected sites within the candidate localities. The data obtained will then be used for the preparation of safety and technical feasibility studies on the potential future repository for all the localities concerned. The comparison of individual localities will thus be more environmentally friendly, economically less demanding and transparent. The second stage will involve deep borehole drilling the aim of which will be to verify geological conditions at depths of up to one kilometre. The data obtained in the first two stages will be used for the recommendation of at least two localities to be presented to the Government. The recommendation will also be required to include the positions of the communities concerned with regard to siting. The third stage will involve further geological and technical work at the two candidate localities.





## PUBLIC RELATIONS

Direct communication with the public in areas potentially eligible for the construction of a deep geological repository continued to be SÚRAO's priority in terms of public relations in 2013. Communication during the year focused on providing information on modifications to overall strategy. SÚRAO is committed to communicating with the municipalities concerned in an open and transparent manner. The identification of investigation areas makes up just the first stage of the geological investigation process. SÚRAO decided during the year to modify the current site selection procedure in order to more effectively fulfil its obligations ensuing from a number of Government Decisions and the Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic.

According to the modified site selection procedure SÚRAO will select the final locality for the future deep repository in three stages. Applications for the identification of investigation areas have been submitted for all candidate localities for the first stage of geological investigation only. Following the completion of this stage, the surface area and boundaries of the rock massif potentially suitable for deep repository siting will be refined for each locality; this, in turn, will be followed by the reduction of both the surface area of potential sites and the number of communities affected.

Local communities situated within an investigation area identified in the first stage will be eligible, under the Atomic Act, to financial compensation. Statutory financial compensation will be provided on an annual basis throughout the whole of the duration of the siting process. SÚRAO has undertaken to inform all the communities concerned of the amount of compensation and to send the relevant monies to those communities no later than 120 days following the identification of an investigation area.

The Ministry of the Environment determined the investigation area for the Kraví hora locality on 30 May 2013. Two NGOs consequently appealed against the decision. Based on a recommendation made by the Appeals Commission, Tomáš Podivínský, the Minister of the Environment at the time, annulled the decision and ruled that it should be reconsidered. No decision has yet been issued for the other localities.

Information via professional presentations on SÚRAO's full range of activities (on all types of radioactive waste, its generation, treatment and disposal as well as on currently operational or closed repositories, the project for the deep geological repository and radioactivity in general) is available at its main information centre in Prague 1, Dlážděná 6, where SÚRAO's head office is located, and at the Richard repository information centre near Litoměřice. In addition to these information centres, SÚRAO has information stands in Lubenec and Rohozná, at municipal offices in Dukovany and Rouchovany, and at its information "corner" in Dolná Cerekev. A total of 1,000 students from Prague and the surrounding area visited the main information centre in Prague in 2013.

SÚRAO continued the publication and distribution of its "News from SÚRAO" quarterly newsletter to individual households at all the deep repository candidate localities during 2013. As far as those living in the Čertovka locality are concerned, particularly in the towns of Lubenec, Blatno and Žihle, SÚRAO regularly publishes information on its activities in local newspapers.

In order to improve awareness of radioactive waste management, SÚRAO organised a technical excursion to the Richard repository and a visit to the Josef Underground Research Centre for representatives of the communities concerned. In addition, SÚRAO organises annual excursions which provide community representatives with the opportunity to visit foreign facilities concerned with nuclear waste issues. In 2013 a visit was made to the facilities of NAGRA, the Swiss national agency responsible for the preparation and implementation of programmes for the safe disposal of all types of radioactive waste produced in Switzerland.

A meeting with local representatives from Zwiilag was organised during the three-day excursion as well as a visit to the Grimsel underground laboratory in which deep repository conditions are simulated and technologies tested for the disposal of radioactive waste in granitoid rock masses. In addition, visits were made to the Breznau nuclear power plant and the Zwiilag central interim storage facility.

The closing conference of the international IPPA (Implementing Public Participation Approaches in Radioactive Waste Disposal) project was held in Prague from 30 September to 1 October. A total of 115 guests from 18 countries attended the conference and, over two days, discussed ways in which to employ the theories and tools of public participation in practical site selection processes. Representatives from state administration offices, research centres, agencies responsible for radioactive waste management and, primarily, from the regions and communities directly concerned with disposal issues expressed their appreciation of the openness of the dialogue and the results of the IPPA project to date.

In order to improve awareness of radioactive waste management issues, SÚRAO commenced the preparation of two new information centres, one of them in Jáchymov, the town in which the Bratrství repository for the disposal of low-level and intermediate-level waste is located, and the other in Bystřice-pod-Pernštejnem at the Kraví hora locality. The opening of both information centres is planned for the middle of 2014.

SÚRAO has a statutory obligation to provide information according to Act 109/1999 on free access to information. Five applications for information under the Act were received during 2013 and one application for information under Act 123/1998, on free access to information on the environment.



### **Provision of information to the public during 2013 according to Act 109/1999 on free access to information**

Number of applications for information under the Act	5
Number of appeals against a ruling	0
Conclusions of proceedings on sanctions for infringement of the Act	0
Other information concerning the implementation of Act 106/1999	-

### **Provision of information to the public according to Act 123/1998 on free access to information on the environment**

Number of applications for information under the Act	1
Number of appeals against a ruling	0
Conclusions of proceedings on sanctions for infringement of the Act	0
Other information concerning the implementation of Act 123/1998	-

### **INVOLVEMENT OF THE GENERAL PUBLIC – ACTIVITIES OF THE WORKING GROUP FOR THE DIALOGUE ON THE DEEP REPOSITORY**

The Working Group for Dialogue on the Deep Geological Repository was established in 2010, supported by the Ministries of Industry and Trade and the Environment. The group, consisting of representatives of the various communities concerned, environmental organisations, the state, Parliament, academic institutions etc., is concerned both with coming up with ways in which to improve the transparency of the decision-making process regarding deep repository siting whilst fully respecting the interests of the general public and with strengthening the active involvement of the public and, specifically, the communities involved in the process. The group's activities are based, in terms of methodology, on the results and experience gained from the EC ARGONA project conducted as part of the 6th Framework Programme for Research and Training. The 7th Framework Programme of the European Commission, known as IPPA, is concerned with the activities of the Dialogue working group in 2013. The main priority of the Working Group for Dialogue is to strengthen the role of the communities concerned through legislative means in connection with which the group prepared a proposal for draft legislation relating to the involvement of such communities in the decision-making process regarding deep repository siting. SÚRAO has a representative in the Working Group for Dialogue and takes an active part in the activities of the secretariat and the preparation of documentation on issues to be discussed at the group's meetings.

### **INTERNATIONAL COOPERATION**

SÚRAO, as similar organisations in other countries which are committed to tackling radioactive waste issues in a responsible manner, is involved in the activities of a number of international organisations. Mutual cooperation, consisting of the exchange of information and direct participation in both practical scientific experiments and the activities of a number of international institutions, forms an integral part of what SÚRAO considers a serious approach to issues surrounding radioactive waste and the nuclear programme in general.

The European Commission (Euratom), the IAEA (the International Atomic Energy Agency) and OECD/NEA (the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development) represent the main sources of information, instigate legislative and regulatory change and coordinate the majority of events in the field of radioactive waste management internationally. The Czech Republic is a signatory to the IAEA Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. SÚRAO, together with the SÚJB, is responsible for the fulfilment of requirements deriving from the Convention.

SÚRAO, in cooperation with the IAEA, is a full member of DISPONET, a network of operators of low-level and intermediate-level waste repositories. Radioactive waste management issues are also handled by the OECD/NEA, specifically by the RWMC, its Radioactive Waste Management Committee. This committee is organised in the form of internal and external working groups. SÚRAO specialists represent the Czech Republic in the IGSC (the Integration Group for Safety Case) and the FSC (Forum on Stakeholder Confidence) working groups.

SÚRAO is active in a number of research and development projects financed by the European Commission both as a mediator and provider of support for the participation of Czech firms and research institutions in such projects and covers around half of the financial costs involved.

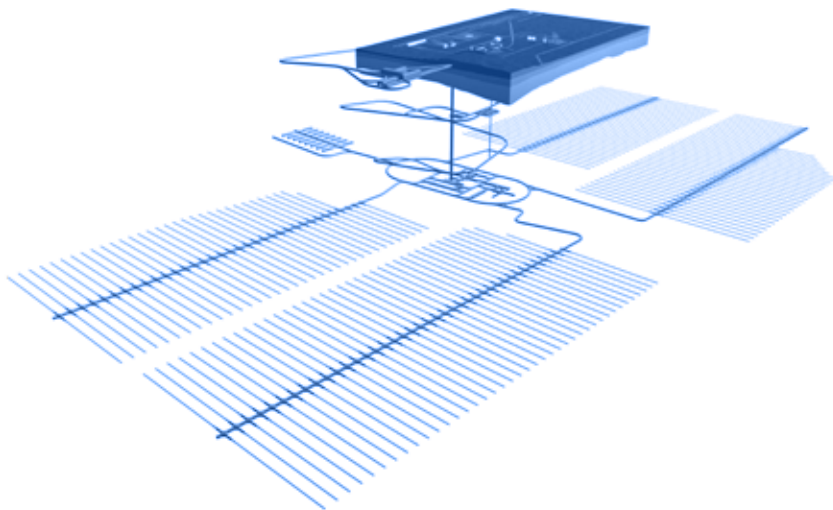
Since 1998 SÚRAO has been involved in the activities of the so-called Club of Agencies which, under the patronage of the European Commission, forms a voluntary platform for the informal exchange of information concerning radioactive waste management.

The most significant area of cooperation at the international level consists of the development and verification of methods for the assessment of repository safety and the demonstration of deep geological repository feasibility. Thus SÚRAO experts are able to take advantage of proven, technically reliable and widely-recognised methods and tools for the long-term forecasting of repository system behaviour.

Bilateral cooperation with partner organisations in other countries is very beneficial for SÚRAO, particularly participation in specific subprojects conducted at partner research facilities. SÚRAO has signed a number of international framework agreements e.g. with Nagra (Switzerland) and Posiva (Finland) and also cooperates on a number of subprojects with SKB (Sweden).

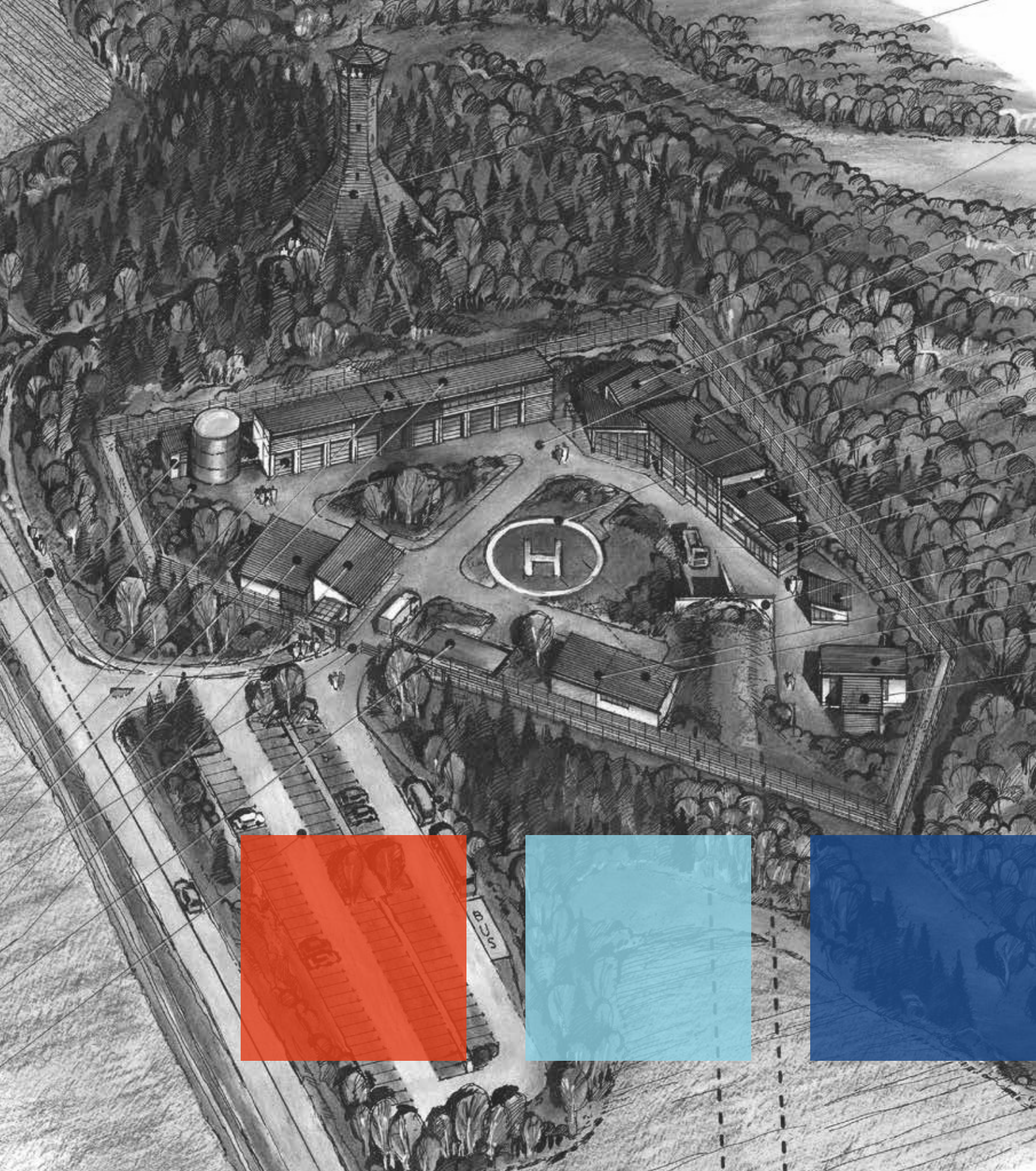
**“ In order to improve awareness of radioactive waste management issues, SÚRAO commenced the preparation of two new information centres. ”**

# DEEP GEOLOGICAL REPOSITORY



The “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic” stipulates that radioactive waste and spent nuclear fuel classed as waste be finally disposed of in a deep geological repository.









# MANAGERIAL, TECHNICAL AND ADMINISTRATIVE MATTERS

In addition to those outlined above, SÚRAO is involved in a whole range of additional activities either in connection with its main area of business or as required by relevant legislation.

## INTERNAL CONTROL SYSTEM

SÚRAO's internal control system was adopted in compliance with Act 320/2001, on financial control in the public administration sector, and implementing Regulation 416/2004. The structure of the internal control system respects SÚRAO's specific activities, its organisational structure in relation to activities performed and the approved number of work positions.

The internal control system is defined in the basic management directives; the most important document consists of the Handbook on SÚRAO's Quality Assurance System and the defined map of processes which forms an Appendix to the Handbook. Basic related management directives consist of the Standing Orders, Staff Regulations, the Internal Auditing System, Decisions of the Managing Director and Authorising Documentation, in compliance with the Financial Control Act. These documents set out the responsibilities of individual departments, the competences and responsibilities of the management and executive officers, as well as the main audit principles and methods to be adopted by SÚRAO's management. Economic management is defined in the following documents: Preparation of the Yearly Plan and Budget, Contract Management, Asset Management, Budgetary Management, Circulation of Accounting Documents and Accounting Processing. Based upon these management directives, a number of in-house regulations have been drawn up which set out the rules governing individual activities and complement the internal control process. Internal regulations define the functions and responsibilities of the Authority's financial officers, including the chief accountant, as well as the procedures to be applied should the required criteria not be met and procedures for individual operations.

Other management directives define the requirements for the implementation of the basic processes in radioactive waste management and repository operation in terms of nuclear safety, radiation protection, physical protection, emergency preparedness, quality assurance and environmental protection and their fulfilment by SÚRAO. These requirements are based on the provisions of the Atomic Act and implementing Regulations as well as SÚJB Regulations. In addition, SÚRAO adheres to generally binding regulations applicable to the public administration sector as well as Act 218/2000 on budgeting rules, Act 219/2000 on state property and Act 137/2006 on public contracts. SÚRAO operates its quality assurance system according to, and employs the methods and procedures set out in, the EN ISO 9001/2008 standard, as amended.

Internal audits are managed and performed, as stipulated in Articles 28 and 29 of Act 320/2001, by the internal auditor who is directly responsible to the Authority's Managing Director. Due to restrictions on the number of approved work positions, the internal auditor is also responsible for the verification of the creation of financial reserves for the future decommissioning of nuclear plants and other nuclear facilities. Internal auditing is increasingly focusing on current requirements, consultation relating to internal processes, commenting on relevant documentation and reviewing particular areas of the Authority's activities.

## QUALITY ASSURANCE AND CONTROL

SÚRAO has implemented and constantly updates a documented quality assurance system complying with the EN ISO 9001/2008 standard. The system is concerned with activities as set out by the Atomic Act, Article 26 (Act 18/1997) and the full range of support processes relating to the operation of the Authority. Quality assurance requirements are principally applied to those processes which relate to research and development in the field of radioactive waste management, the construction, operation and closure of repositories and SÚRAO's obligations towards radioactive waste producers, state authorities and the public. The main objectives of the quality assurance system are to ensure high levels of efficiency and quality as well as compliance with established work processes with respect to all aspects of SÚRAO's activities.

The quality audit plan for 2013 was approved by the Managing Director in February 2013. 7 audits were planned, of which 3 at radioactive waste producers, 1 audit at the test laboratory for waste transport container testing, 1 internal processes audit and 1 contract audit. Four audits were in fact conducted; three audits were postponed for organisational reasons. No discrepancies or serious deficiencies were detected during the audits.

11 external inspections of SÚRAO performance were conducted by the SÚJB during 2013. In addition, the Regional Mining Authority in Most performed three inspections and the Principal Mining First-Aid Station in Most performed 4 inspections. No serious deficiencies were detected during these inspections and a small number of minor issues were cleared up quickly to the full satisfaction of the parties concerned.

**“ The structure of the internal control system respects SÚRAO's specific activities, its organisational structure in relation to activities performed and the approved number of work positions. ”**



## PERSONNEL, MATERIAL AND TECHNICAL MATTERS

The plan of activities for 2013 contained 46 approved work positions. The average registered number of physical employees during the year was 45. When necessary, certain work for SÚRAO is supplied for the fulfilment of specific tasks or in the form of one-off or fixed-term employment contracts. SÚRAO's staff attended various training courses in compliance with legislative requirements; these courses related to obligatory professional training, the further improvement of qualifications and language training. SÚRAO's statutory obligations concerning health and safety at work and fire protection (set out by the Labour Code and the Fire Protection Act) were met by employing a specially qualified person.

SÚRAO fulfilled its obligation as set out in Act 435/2004 (the Employment Act) specifying the proportion of handicapped persons in the total number of employees.

## FINANCIAL MANAGEMENT

SÚRAO's activities are financed primarily from the Nuclear Account and Ministry of Industry and Trade funds in compliance with the Atomic Act, Article 28, paragraph 1 which sets out rules for the management of radioactive waste disposed of prior to the Act coming into force.

SÚRAO is authorised to manage state property and consequently maintains the relevant accounts in pursuance of Act 563/1991 on accounting, Act 218/2000 on budgeting rules, and implementing Regulation 410/2009. SÚRAO's budget is determined according to a budget structure defined by Ministry of Finance Regulation 323/2002, as amended.

SÚRAO creates no reserves and all its revenues from services provided to radioactive waste producers as well as unused budget funding (provided as transfers) are returned to the Nuclear Account.

### Utilisation of Budget Funding in 2013

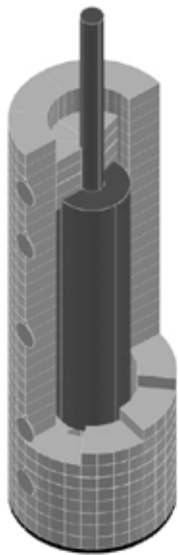
Item No.	Item	CZK thousand	Approved budget	Adjusted budget	Budget utilisation	Utilisation percentage
<b>EXPENSES</b>						
5	Current expenses		94,160	94,850	88,778	93,6
501	Wages and salaries		16,542	16,542	17,209	104.0
502	Other remuneration		1,019	1,019	875	85.9
503	Employer's statutory insurance contributions		5,971	6,661	6,742	101.2
5342	Transfer to fringe benefits fund		166	166	172	103.7
6	Capital expenses		69,890	69,200	46,028	66.5
61	Asset acquisitions and related expenses		69,890	69,200	46,028	66.5
<b>Total expenses:</b>			<b>164,050</b>	<b>164,050</b>	<b>134,806</b>	<b>82.2</b>
<b>REVENUES</b>						
411	Non-investment transfers from the central budget		88,360	89,050	84,000	94.3
421	Investment transfers from the central budget		69,890	69,200	47,000	67.9
	Funding through chapter 322 of the Ministry of Industry and Trade		5,800	5,800	5,674	97.8
<b>Total revenues:</b>			<b>164,050</b>	<b>164,050</b>	<b>136,674</b>	<b>83.3</b>

Note: Items 411 and 421 consist of transfers from the Nuclear Account; CZK 5,673,530 was received as a transfer from the budget of the Ministry of Industry and Trade. In transfers received, funds transferred to the Nuclear Account (payments by small radioactive producers and other Authority revenues) are not included. Revenues from the Nuclear Account which exceed current year expenses are re-transferred to the Nuclear Account at the beginning of the following year.

Expenses are subdivided into current expenses and capital expenses. Expenses relating to technical development projects, materials purchased and utilised, telecommunications services, rental payment services, education and training, consultancy services, travel expenses and the purchase of external services are included in current expenses. Expenses relating to the DGR programme, the reconstruction of existing repositories, the purchase of information technology and so on are included in capital expenses. A detailed review of the utilisation of budget funding by individual item, accompanied by a commentary, has been submitted to SÚRAO's Board.

The exceeding of the utilisation of budget funding in items 501, 503 and 5342 is in compliance with Article 25, paragraph 1b of Act 218/200 on budgeting rules. Funds to cover these expenses were transferred from the reserve fund.

# MOCK-UP JOSEF



The “Mock-up Josef” project, concerned with the verification of engineered barriers, has been underway since 2010 at the Josef Underground Research Facility near Chotilsko in the Příbram region. The aim of the project is to research in detail the properties and behaviour of bentonite barriers in deep repositories. The project involved the construction of a realistic model of a supercontainer which was emplaced in a disposal well sunk in part of the Josef underground facility at the end of 2012; data collection commenced in January 2013.





## BALANCE SHEET AS AT 31 DECEMBER 2013

	Current period		Net	Previous period
	Gross	Correction		
<b>ASSETS</b>	<b>849,822</b>	<b>323,110</b>	<b>526,712</b>	<b>502,298</b>
<b>A. Fixed assets</b>	<b>832,906</b>	<b>323,110</b>	<b>509,796</b>	<b>496,963</b>
I. Intangible fixed assets	429,982	199,159	230,823	239,888
II. Tangible fixed assets	402,924	123,951	278,973	257,075
III. Long-term financial assets	0	0	0	0
IV. Long-term receivables	0	0	0	0
<b>B. Current assets</b>	<b>16,916</b>	<b>0</b>	<b>16,916</b>	<b>5,335</b>
I. Stocks	812	0	812	0
II. Short-term receivables	1,821	0	1,821	1,142
III. Short-term financial assets	14,282	0	14,282	4,193
<b>LIABILITIES</b>			<b>526,712</b>	<b>502,298</b>
<b>C. Equity capital</b>			<b>510,493</b>	<b>492,228</b>
I. Owned capital and adjustments			572,897	526,869
II. Financial funds			4,049	38
III. Profit/Loss account			-92,046	-54,599
IV. Budget management income and expenditure account			25,594	19,920
<b>D. Liabilities</b>			<b>16,218</b>	<b>10,070</b>
I. Reserves			0	0
II. Long-term payables			0	0
III. Short-term payables			16,218	10,070



# PROFIT AND LOSS ACCOUNT

## AS AT 31 DECEMBER 2013 (CZK 000)

Item No.	Item	Current period Main activity	Previous period Main activity
<b>A.</b>	<b>Total expenses</b>	<b>140,723</b>	<b>122,020</b>
I.	Expenses from activities	111,587	112,472
II.	Financial expenses	86	72
III.	Transfer expenses	29,050	9,476
IV.	Shared tax expenses	0	
<b>B.</b>	<b>Total revenues</b>	<b>103,276</b>	<b>80,251</b>
I.	Revenue from activities	20,165	1,251
II.	Financial revenue	6	0
III.	Revenue from taxes and charges	0	
IV.	Transfer revenue	83,105	79,000
V.	Revenue from shared taxes		
VI.	SURPLUS / DEFICIT		
1.	Surplus / deficit before tax	-37,447	-41,769
2.	Surplus / deficit after tax	-37,447	-41,769



# AUDITORS' REPORT INCLUDING AUDITORS' OPINION

We have audited the financial statements of the Radioactive Waste Repository Authority with headquarters in Prague 1, Dlážděná 6, postcode 110 00, company identification number 66000769, comprising the balance sheet and the profit and loss account as at 31 December 2013, and annexes to the financial statements for 1 January to 31 December 2013.

## MANAGEMENT'S RESPONSIBILITY FOR THE FINANCIAL STATEMENTS

The management of the Radioactive Waste Repository Authority with headquarters in Prague 1, Dlážděná 6, postcode 110 00 is responsible for the preparation and fair representation of the financial statements in accordance with Czech accounting regulations. Responsibility includes the design, implementation and execution of financial statements that are free from material misstatement, whether due to fraud or error, the selection of appropriate accounting methods and the provision of adequate accounting estimates.

## AUDITORS' RESPONSIBILITY

Our responsibility is to report our opinion on the financial statements audited. The audit has been conducted in accordance with the Czech Auditor Act, International Standards on Auditing and relevant implementing regulations issued by the Czech Chamber of Auditors. Under these legal regulations and in adherence to relevant ethical standards each audit is planned and performed in such a way as to provide the auditors with sufficient evidence to give reasonable assurance that the financial statements are free from apparent material misstatements.

The audit includes audit procedures aimed at obtaining conclusive evidence relevant to the amounts and disclosures given in the financial statements. The audit procedures employed depend on the auditor's judgement, including his assessment of the potential risk that the financial statements might contain considerable material irregularities due to fraud or mistake. Risk assessment considers the results of internal audits relevant to the preparation and presentation of the financial statements. The aim of internal audit assessment is to recommend adequate audit procedures without expressing the auditor's view of the efficiency of internal audits. The audit also includes an assessment of the adequacy of the accounting methods employed and estimates made by the management of the accounting entity, as well as an evaluation of the overall adequacy of the presentation of information in the financial statements.

We consider that the probative information obtained gives an adequate basis for forming our opinion.

## AUDITORS' OPINION

In our opinion, the financial statements give a true and fair view of the assets, liabilities and financial situation of the Radioactive Waste Repository Authority with headquarters in Prague 1, Dlážděná 6, postcode 110 00 as at 31 December 2012 as well as of costs, revenue and profit/loss, cash flows and a review of changes in equity as at 31 December 2013 in compliance with the accounting regulations effective in the Czech Republic.

Ivančice, 4 March 2014

Jiřina Závíšková  
auditor  
licence number 714

# SÚRAO'S BOARD

The activities of SÚRAO are supervised by its Board the membership of which comprises representatives of MPO, MF and MŽP, major radioactive waste producers and the public. SÚRAO's Board, by means of its decisions and recommendations, takes an active part in the activities of SÚRAO.

In 2013 Súrao's Board consisted of the following members:

**Mr. Pavel Gebauer** (Chairman of the Board), Head of the Electrical Energy Department at the MPO;

**Mr. Ladislav Štěpánek** (Vice-Chairman of the Board), Director of the Production Section at ČEZ;

**Mr. Vladimír Hlavinka**, Advisor to the CEO of ČEZ;

**Ms. Zdeňka Vojtíšková**, Economist at the MF;

**Mr. Martin Holý**, Director of the Geology Department at the MŽP;

**Mr. Jan Horník**, Senator;

**Mr. Pavel Gryndler**, Environment Department of the Litoměřice town council;

**Mr. Vítězslav Jonáš**, Chairman of Energetické Třebíčsko, Councillor of Dukovany;

**Mr. Bronislav Grulich**, Chairman of the Jáchymov town council;

**Mr. Aleš John**, Director General of the Nuclear Research Institute Řež (to the 77th meeting of the Board);

**Mr. Karel Křížek**, CEO of ÚJV Řež (from the 78th meeting of the Board);

**Mr. Štěpán Svoboda**, Head of the Research & Development Centre at Chemcomex Praha.

SÚRAO's Board reviewed the SÚRAO Annual Report for 2013 at its 80th meeting on 21 March 2014 and recommended the Annual Report be submitted to the Ministry of Industry and Trade.



# CONTACTS

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## ABBREVIATIONS USED:

<b>CEG</b>	Centre for Experimental Geotechnics
<b>ČVUT</b>	Czech Technical University in Prague
<b>DGR</b>	deep geological repository
<b>MF</b>	Ministry of Finance
<b>MPO</b>	Ministry of Industry and Trade
<b>MŽP</b>	Ministry of the Environment
<b>NGOs</b>	non-governmental organisations
<b>NPP</b>	nuclear power plant
<b>OECD/NEA</b>	Nuclear Energy Agency of the Organisation for Economic Co-operation and Development
<b>SNF</b>	spent nuclear fuel
<b>SÚJB</b>	State Office for Nuclear Safety
<b>SÚRAO</b>	Radioactive Waste Repository Authority
<b>URF</b>	Underground research facility

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