SÚRAO | RADIOACTIVE WASTE REPOSITORY AUTHORITY

20 years SÚRAO

ANNUAL REPORT 2017

Radioactive Waste Repository Authority

SÚRAO’s Mission and the Principles Applied to its Activities

The Radioactive Waste Repository Authority (SÚRAO) is a state organisation and its activities and management are regulated by Article 113 of Act 263/2016 (the Atomic Act). 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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Managing Director's Introduction

Dear friends, colleagues, ladies and gentlemen,

The Radioactive Waste Repository Authority (SÚRAO) has successfully fulfilled its principal mission – statutory responsibility for the safe disposal of all radioactive waste produced in the Czech Republic – since 1997, of which the continued safe operation of our three repositories provides ample proof. The Authority occupies an important position in the overall radioactive waste management system and is well prepared for the challenges it will face in the future.

We aim, via this Annual Report, to provide you with an update on both our activities and the results achieved in 2017.

All three Czech repositories for low-level and intermediate-level waste were operated in compliance with the relevant licences during the year. We continue to devote particular attention to existing repositories and their safe operation as well as to transparent communication with the general public at the local level. The Richard Civic Control Commission, which comprises representatives of the town of Litoměřice and surrounding communities and the Ústí-nad-Labem region, continued its valuable work in 2017. Further, based on the success of the Richard Civic Control Commission, the Bratrství Civic Control Commission was established during the year.
Concerning the development of the deep geological repository (DGR) for high-level waste and spent nuclear fuel, the first stage of geological investigation work continued with the aim of reducing the number of candidate sites from 9 to 4. The main focus of the site selection process will always be on the safest possible DGR design. Each stage of the site assessment process and the gradual reduction in their number will comprise detailed data analysis which proves that repository construction at the site is feasible and that the safety requirements correspond both to statutory obligations and international recommendations.

SÚRAO has completed the construction of the Bukov Underground Research Facility (URF), which will serve to provide the arguments, data and characteristics essential for the assessment of the safety of the future deep geological repository with concern to depths in the rock environment at which it is envisaged that the DGR will be constructed. As early as in the construction phase of the Bukov URF, the first regime measurements were taken and both the research of the properties of the rock massif and the first experimental projects commenced. The Bukov URF has thus become an integral part of the Czech DGR development programme and, at the same time, represents an opportunity to enhance the involvement of the Czech Republic in wider international research in this field.

The project for the development of a waste disposal package/disposal container continued during the year. This particularly important project in the field of engineered barriers will exert a substantial impact on the technical, safety and economic design of the future DGR disposal system at the chosen site. The proposed waste disposal package will fully comply with all the requirements concerning the required lifetime and safety considerations.

SÚRAO is also very deeply involved in a range of international research projects at both the bilateral and multilateral levels. It is actively involved in European research projects through its participation in the Steering Committee of the Implementing Geological Disposal Technology Platform (IGD-TP) and through the preparation of the new programming period 2019 to 2022 of the so-called European Joint Programming Phase 1.

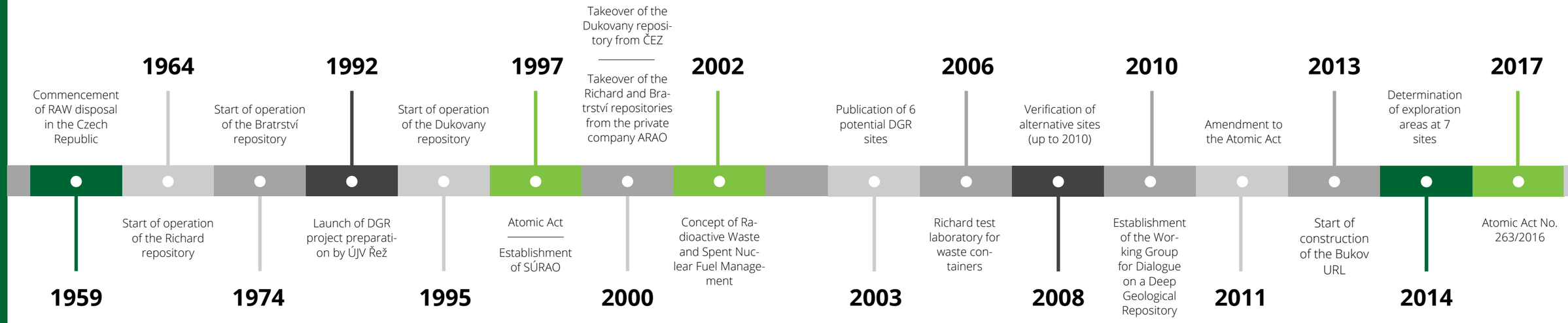
Through active international cooperation with the French agency ANDRA and other similar organisations, SÚRAO's international prestige has been enhanced significantly. Indeed, a further two Memoranda of Cooperation were signed during the year, i.e. with the Korean agency KORAD and the Italian agency for the disposal of radioactive waste SOGIN. With respect specifically to the Czech DGR development programme, SÚRAO's cooperation with the Finnish company POSIVA, with whom a contract has been signed concerning the transfer of the highest level of know-how currently available in the field of DGR construction in crystalline rocks, is of particular importance.

Finally, allow me to say that, as in previous years, SÚRAO successfully fulfilled its mission in 2017. For 20 years we have provided for the safe operation of the country's radioactive waste repositories in compliance with international standards and, in cooperation with leading Czech experts and foreign colleagues, we continue to closely follow and subsequently implement 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.

Safe radioactive waste disposal

The Czech Republic also has a long history and experience of the storage and disposal of such waste. Up to the end of 1991, the Institute for the Research, Production and Use of Radioisotopes was responsible for the management and final disposal of RAW. From 1992, when the country's waste repositories were privatised, NYCOM a.s. and, subsequently, ARAO a.s. performed these activities. Following the approval and coming into force of the Atomic Act in 1997, waste repositories were transferred to the state, and their safe operation as well as the storage and disposal of RAW in general was entrusted to a specially-established state authority – the Czech Radioactive Waste Repository Authority (SÚRAO).



Current Situation in Radioactive Waste Management

Low-level and intermediate-level waste, liquid or solid, is generated during the operation of nuclear reactors and when dealing with ionising radiation sources in the research, industrial and health sectors. Due to its properties, amount and radioactivity level this waste 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 fully implemented in the Czech Republic.

Low-level waste generated at nuclear power plants is stored at a surface disposal facility located within the Dukovany nuclear power plant (NPP) complex. The facility's total disposal capacity of 55 000 m³ 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 such waste which will have to be stored following the decommissioning of both nuclear power plants.

Institutional low-level and intermediate-level waste generated in the research, industrial and health sectors is disposed of at the Richard (near Litoměřice) and Bratrství (near Jáchymov) repositories; in addition, the Dukovany repository is partly utilised for this purpose.

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 repository, which has a total RW disposal volume of 10,249 m³, since 1964. Around 75% of the capacity of the Richard repository has already been filled. Therefore, using experience of repository operation to date, and in compliance with a comprehensive safety analysis, it is envisaged that it will be possible to expand the disposal capacity of the Richard repository by adapting currently unused space within the existing repository complex. SÚRAO has, in the past, adapted several mined spaces at the Richard facility for repository use and, based on experience gained, predicts that adaptation could be completed within two years of the issuance of the relevant licence by the State Office for Nuclear Safety (SÚJB).

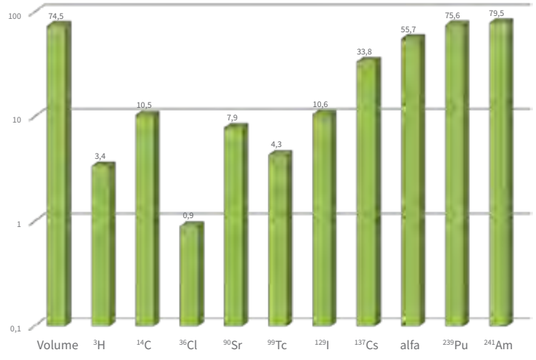
The Bratrství repository is designed for the disposal of waste containing naturally-occurring radionuclides. It was constructed in one of the mined cavities of a former uranium mine and contains five chambers with an overall capacity of approximately 1,200 m³. The facility was put into operation in 1974. The capacity of the Bratrství repository will soon be fully utilised and it is envisaged that the disposal of waste at this repository will end in around 2020. It is planned that this type of waste will subsequently be disposed of at the Richard repository for which this facility has already obtained an SÚJB licence.

The operation of all Czech repositories, including the monitoring of the now-closed Hostim repository, is managed by SÚRAO in compliance with the relevant licences granted by the SÚJB and, in the case of the Richard and Bratrství repositories, in compliance with permits and licences issued in accordance with mining regulations.

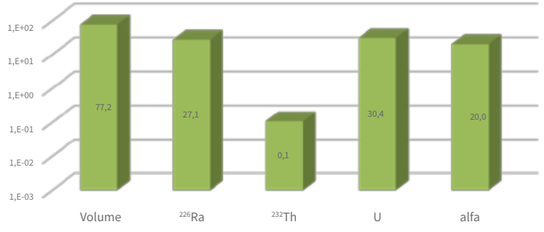
A certain amount of long-lived low-level and intermediate-level waste is also generated which cannot be disposed of in existing facilities. For this type of waste, special requirements are in place concerning the method and quality of conditioning necessary for its storage and subsequent disposal in a deep geological repository (DGR). This waste is currently being stored in a specially-designated section of the Richard repository until such time as the deep geological repository comes into operation.

High-level waste and spent nuclear fuel, classed as waste, will also be disposed of in the future deep geological repository. Until then spent nuclear fuel producers reserve the right to decide on its potential further use (reprocessing). Until such time as the DGR becomes operational, this waste will be stored by its producers.

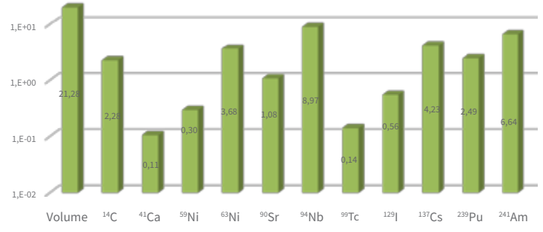
Utilisation (%), Richard repository



Utilisation (%), Bratrství repository



Utilisation (%), Dukovany repository



↑ Richard Repository

↑ Bratrství Repository

↑ Dukovany Repository

Operation of the Dukovany Repository

The Dukovany repository is operated by SÚRAO through ČEZ, the Czech power company, on a contractual basis. 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 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. The level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, the management of emergency radiation situations, and security was ensured and enhanced during the year in compliance with the relevant licences granted by the SÚJB.

In 2017, the repository accepted 645 disposal packages containing radioactive waste (129 m^3); all the disposal packages consisted of metal 200-litre drums. The disposal packages were placed in vault D8.

The Dukovany NPP (EDU) delivered for disposal a total of 214 waste disposal packages (42.8 m^3) in 2017, of which 19 disposal packages of unstabilised waste and 195 waste disposal packages of used ion exchangers and sludge solidified into an aluminosilicate matrix.

The Temelín NPP (ETE) delivered for disposal 431 waste packages containing radioactive waste (86.2 m^3) in 2017, of which 368 waste packages of bituminised waste, 63 waste packages of used ion exchangers and sludges solidified into an aluminosilicate matrix. No institutional waste was accepted for disposal in 2017.

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 during the year.

Three inspections were conducted by the SÚJB at the Dukovany repository during 2017; no breach of legal regulations was discovered.

Basic information on waste disposed of during 2017 is provided in the following table:

Dukovany repository

Operation during 2017:

Volume of waste disposed of uložených odpadů	m^3 of waste packages (WP)	129 / 645
of which from EDU	m^3 / WP	42,8 / 214
of which from ETE	m^3 / WP	86,2 / 431
of which institutional waste	m^3 / WP	0 / 0
Mass of the accepted waste	Tonnes	155,4

Operation of the Richard and Bratrství Repositories

Both nuclear facilities – the Richard and Bratrství repositories – were operated by SÚRAO during 2017 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 maintaining and improving the level of nuclear safety, radiation protection, technical safety, radiation situation monitoring, the management of emergency radiation situations, and security of these repositories.

In 2017, 418 waste packages containing radioactive waste (90.3 m^3) were disposed of at the Richard repository with a total mass of 134.4 t and no waste packages were accepted for the purpose of storage. No waste packages were disposed of at the Bratrství repository during 2017.

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 2017 by the SÚJB (three inspections at the Richard repository and two inspections at the Bratrství repository) and the relevant mining supervisory bodies (two inspections at the Richard repository). A number of deficiencies were detected by the SÚJB during inspections at the Bratrství repository concerning the non-fulfilment of limiting condition 8.1 (the non-functioning of a branch of the lighting circuit in one of the access corridors) and a requirement set by Article 80, paragraph 4 of Act 263/2016 concerning the regular medical check-ups of radiation workers. The deficiencies were remedied and the relevant corrective measures taken of which the SÚJB was informed.
SÚRAO also operates a test laboratory within the Richard repository complex for the testing of containers and radioactive substances of special form; the laboratory is designed to test containers for the transport, storage and disposal of radioactive or fission material with a mass up to 3,200 kg as well as to test radioactive substances of special form according to relevant test procedures. Two B(U) type transport containers, one A type container and one IP1 container were tested during 2017. The laboratory also provided consultancy services to container users and manufacturers throughout the year. The laboratory's total income for 2017 amounted to CZK 121.8 thousand.

A tender for the contractor for the first stage of the reconstruction of the Richard repository was prepared and published in 2017. The reconstruction, which will take place from 2018 to 2020, will focus on the conversion of currently unused underground spaces to disposal chambers.

As part of Richard repository operation, the administration of abandoned sources and radioactive waste was ensured in compliance with Article 91, paragraph 2b) and 3) of Act 263/2016. SÚRAO assumes this responsibility upon receiving notification from the State Office for Nuclear Safety announcing that the owner was not found within the statutory time limit. The funds required for the processing of such waste into a form suitable for its storage and subsequent safe disposal are covered by the Ministry of Industry and Trade.

An overview of abandoned sources and radioactive waste is provided in the following table:

Year	Number of items	Cost (CZK thousand)
2015	1	0
2016	4	0
2017	4	181,7

Basic information on the waste disposed of during 2017 is provided in the following table:

Richard repository – operation during 2017:		
Volume of waste disposed of	m^3 / WP	90,3 / 418
Mass of the accepted waste	T	134,4
Number of waste containers accepted for disposal	Number	0

Bratrství repository – operation during 2017:		
Volume of waste disposed of	m^3 / WP	0 / 0
Mass of the accepted waste	T	0

Licencing and Radiation Protection

The main aim of activities related to the licencing procedure and radiation protection is to ensure repository operation and radioactive waste management compliance with the provisions of the Atomic Act and relevant Regulations; changes in documentation primarily concern Regulation 377/2016, on radioactive waste management and decommissioning, and Regulation 422/2016, on radiation protection and the securing of radionuclide sources.
The licencing procedure for the Richard, Bratrství and Dukovany repositories previously covered a period of five years. Licences issued by the State Office for Nuclear Safety under previous legislation are valid until the end of 2026; documentation describing exposure situations was adapted to the new legislation by the end of 2017; management system programmes must be harmonised by the end of 2019. 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 standardised by an SÚJB commission are used for safety analysis purposes.

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 fulfilment of requirements relating to radiation protection (as defined by Regulation 422/2016) has been verified during the monitoring of all the repositories including the now-closed Hostim repository. Individual dosimetry monitoring was provided for SÚRAO's employees, the health, expertise and skills of A and B category repository staff were verified, and the inventory of individual doses received by SÚRAO´s staff members as well as the inventory of SÚRAO-owned radiation sources updated during the year. 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 as well as with concern to regular inspections of compliance with requirements concerning radiation protection at SÚRAO's facilities.

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 the emergency preparedness of nuclear installations and facilities containing ionising radiation sources and on requirements concerning the content of the internal Emergency Plan were satisfied and harmonisation with Regulation 359/2016 on details for the managing of emergency radiation situations was prepared in cooperation with the SÚJB.

Maintaining an Inventory of Accepted Radioactive Waste and Nuclear Material

SÚRAO was responsible, according to previous legislation, i.e. Act 18/1997, Article 26d), for maintaining an inventory of accepted radioactive waste and its producers. Detailed rules for maintaining such an inventory were set out in SÚJB Regulation 307/2002, on radiation protection. Records of accepted radioactive waste were 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 was maintained in compliance with SÚJB Regulation 213/2010, on maintaining an inventory and performing the inspection of nuclear materials and on the reporting of data required by the regulations of the European Communities. The validity of the licence expired at the end of 2017 and SÚRAO applied for a new licence which was granted on 3 November 2017 with validity for an indefinite period. Nuclear materials are stored at the Richard repository at which the appropriate physical protection level is ensured as required by SÚJB Regulation 361/2016, on the physical protection of nuclear materials and nuclear installations and their categorisation.
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. An inspection of the physical inventory of nuclear material is held once per year with the participation of EC and IAEA representatives.

Mining Safety

The operation of the Bratrství and Richard underground repositories is authorised based on licences which allow "specific encroachment into the Earth's crust" issued in compliance with the Mining Act on mining operations 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.
Emergency preparedness exercises relating to the coordination of occupational safety were held throughout the year at both the Richard and Bratrství repositories in cooperation with the HBZS (Principal Mining First Aid Station) in Most and in accordance with the Emergency Plans issued by the relevant mine managers. The exercises and inspections proved 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.

Richard repository, Litoměřice

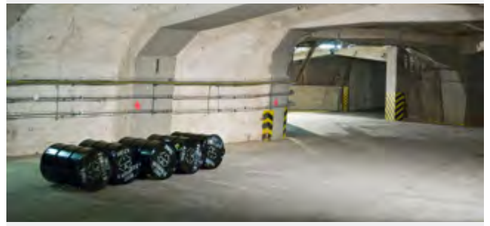
Since

1964

Volume of waste disposed of:

Up to 2000 — **4790 m³**

2000–2016 — **2615 m³**



Dukovany repository, Rouchovany

Since

1995

Volume of waste disposed of:

1995–1999 — **1468 m³**

2000–2016 — **6171 m³**

Bratrství repository, Jáchymov

Since

1974

Volume of waste disposed of:

Up to 2000 — **603 m³**

2000–2016 — **324 m³**

Deep geological repository

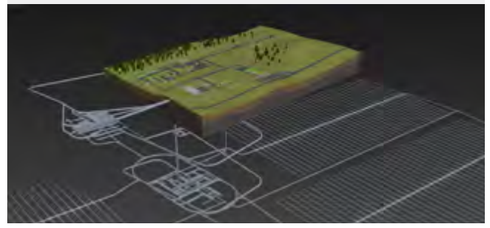
Since

2065

Planned for roughly

9000 tonnes

of spent nuclear fuel



Repositories and their capacity

The Bratrství waste repository, designed for the disposal of waste containing only natural radionuclides, is located near the town of Jáchymov in the foothills of the Krušný (Ore) Mountains, and the Richard repository, designed for the disposal of institutional waste, is situated beneath the Bídnice hill above the town of Litoměřice. The Dukovany repository is located within the Dukovany nuclear power plant complex and is intended for the disposal of radioactive waste from the Dukovany and Temelín nuclear power plants. At present, the three repositories contain in total around 19,000 m^3 of radioactive waste.

The Czech Republic also has one closed repository situated approximately three kilometres east of the town of Beroun in the former Hostim I (also known as Alkazar) limestone quarry. The repository was in operation from 1959 to 1964. A full waste inventory was conducted of the repository in the 1990s following which it was decided that the facility would be closed permanently. SÚRAO monitors the radiation situation in the area of the former repository on a regular basis.

Deep geological repositories for high-level waste and spent nuclear fuel serve for the permanent disposal of spent fuel from nuclear reactors and, to a lesser extent, high-level waste produced in the nuclear, industrial, research and healthcare sectors. As far as the Czech Republic is concerned, it is planned that the deep repository will be situated in a suitable crystalline rock massif around 500 metres below the earth’s surface. The commencement of the construction phase is scheduled for 2050. The design of the deep repository takes into account the spent fuel from the operation of the country’s existing two nuclear power plants as well as planned new nuclear sources. This information forms the basis for the determination of both the technical design of the facility and the amount of spent fuel to be disposed of, which is expected to amount to around 10,000 tonnes.

Development of a Deep Geological Repository for High-Level Waste and Spent Nuclear Fuel

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 which cannot be disposed of at existing repositories be finally disposed of in a deep geological repository. The construction of such a repository in the Czech Republic is envisaged. The safety of the waste disposed of will be ensured by means of a system of both engineered and natural (geological) barriers which are able to 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 of 1999 and the updated version of 2011 available on SÚRAO’s website (www.surao.cz).

Site Selection

Potentially suitable sites for deep geological repository construction were selected by the Czech Geological Institute in 1992. Following a further assessment of DGR 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.[1] 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 in terms of the siting of the DGR 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 which led to the identification of the Chlum reserve site. However, no further work was carried out at this site due to complex conflict of interest issues (Šumava Protected Landscape Area, the presence of rare animals, proximity to the state borders with Austria and Germany, etc.). In addition, an area close to a uranium mine at Dolní Rožínka (Kraví hora) was added to the list of candidate sites in 2011.

For the same reason, work commenced in 2014 on a project concerning the assessment of geological and other information on selected parts of the Bohemian Moldanubian zone with respect to potential suitability for DGR siting with the aim of identifying suitable rock blocks for the location of the deep geological repository in the vicinity of both nuclear plants. Field research work was completed in 2017 and preliminary suitable rock blocks in the wider area of both nuclear plants were identified.

A research project entitled “Geophysical Work for the Description of the Geological Structures of Potential Sites for the Deep Geological Repository in the Czech Republic” was launched in 2017. The objective of the project is the geophysical verification of the near-surface and deep structures in the wider area of potential sites aimed at refining existing geological models and reducing uncertainties.

Any decision on the protection of rock masses suitable for DGR siting via the identification of investigation areas for specific encroachment into the Earth’s crust (Article 17 of Act 44/1988, as amended) must be preceded by detailed research and/or geological investigation work. Consequently, investigation areas have been identified at the Březový potok, Čertovka, Čihadlo, Horka, Hrádek, Magdaléna and Kraví hora sites. Applications were submitted in 2013 for the first investigation stage (site selection stage without technical operations) and the decisions came into force in mid-2015. SÚRAO applied in 2016 for the extension of the validity of investigation area status. Although this was merely a formal step, a number of associations and municipalities once again filed appeals against the decisions. Three appeals are thus in process in each case of the identification of investigation areas in spite of the fact that the identification of investigation areas within each site is already subject to appeal in the District Court for Prague 1 by certain associations and municipalities. The identification of investigation areas has, thus, become a complex legal problem which, in SÚRAO´s view, has no simple viable solution, i.e. a legally valid decision applicable in the foreseeable future. Therefore, SÚRAO decided to withdraw its applications for the extension of the validity of investigation areas for specific encroachment into the Earth’s crust and is submitting new applications in stages in order to be able to continue its research work at the sites in accordance with the decision on reducing the number of candidate sites by the end of 2018.

The selection of the site for the construction of the deep geological repository will be carried out in several stages and the series of criteria and indicators defined in the SÚRAO MP22 document will be assessed in each stage. The criteria are based on the requirements of Czech legislation and on recommendations provided by the International Atomic Energy Agency. The methodology for the application of the various criteria to the assessment and comparison of the localities has already been verified. The preparation of the key documentation is being conducted in cooperation with foreign experts from Posiva Oy and SKB.

The first stage, to be completed by the end of 2018, envisages the assessment of all the sites according to common criteria regarding the suitability of DGR construction in terms of long-term safety, the potential impacts of the repository´s construction and operation on the environment as well as the socio-economic impacts of the repository´s construction and operation on community development and the living conditions of the local people. Based on the results of this assessment, four sites will be recommended for the next stage of investigation work and submitted to the Government for approval. Work during 2017 concentrated exclusively on this stage of the process, i.e. the preparation of all the relevant information, documents and arguments for the assessment of the sites.

The next stage will focus on obtaining the relevant knowledge of the envisaged depth of the repository and the surroundings and its interpretation for the identification of the final and reserve deep geological repository sites. It is assumed that the site assessment process will be similar to that employed in the first stage. All the relevant documents will be drawn up: site description, the assignment safety report study, the siting study, a study of the impacts on the environment as well as a socio-economic analysis for each of the sites investigated and an evaluation of all the sites according to set criteria. A deeper knowledge of the sites concerned based on information obtained from technical studies and ongoing research and development will serve for evaluation and comparison purposes as well as for the subsequent recommendation of the final and reserve sites.

The final site will subsequently be subjected to detailed geological research. The data obtained will be used to demonstrate the fulfilment of safety requirements and to prove that the site selected is suitable for deep geological repository construction. The reserve site will be used in the case of unforeseen events during the detailed characterisation stage.

The above strategy is described in detail in the “DGR Development in the Czech Republic – Action Plan 2017-2025” document which was completed, in cooperation with Posiva Oy and SKB, in 2017. SÚRAO is working hard to meet the deadline set by the “Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic”, i.e. with concern to the identification of a final site in 2025. Obtaining the relevant data from significant depths beneath the Earth’s surface depends not only on technical considerations but also on the granting of permission for the establishment of investigation areas at the sites concerned. Experience to date has shown that procedural issues will probably make up the key factor in terms of meeting the milestones set out in the Concept.

[1] The results of the assessment of the Czech Republic were provided in the SÚRAO 2002 Annual Report which was approved by Government Decision No. 642 of 30 June 2003.

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)" and the updated version thereof 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. Two structural container designs have been proposed, both of which are currently being subjected to verification.

A pre-project study of a fully robotised method for the emplacement of disposal containers in horizontal disposal boreholes was conducted in 2017. It is envisaged that this advanced disposal concept will have significant economic impacts on operations in the underground part of the repository.

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 super-container 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. The project continued in 2017 with the continuous assessment of the data collected.

A project entitled "Research Support for the Design of the Deep Repository", commissioned in 2015, is being conducted by a consortium led by the Czech Technical University in Prague. Work on the optimisation of the technical design of various important technological systems within the deep geological repository concerning technical feasibility, operational safety and economic considerations has been underway since 2016. The environmental characteristics of the sites considered and the impacts of repository construction and operation have already been assessed. Moreover, feasibility studies have been conducted for each site based on local conditions and concerning potentially suitable rock blocks according to 3D structural-geological models in defined investigation areas and the assessment of the environmental impacts of the potential construction and operation of the deep geological repository. All the documents prepared, i.e. feasibility studies, environmental impact studies and site safety assessment studies (operational safety) accompanied by the assessment of sites in terms of long-term safety will form background materials for the drafting of site safety assessment studies which will form the key basis for the assessment of the sites and the subsequent reduction in their number for the following DGR development stage. The completion of the various documents is expected in the first quarter of 2018.

Activities Concerning the Assessment of DGR Safety

The "Research Support for DGR Safety Assessment" project continues in compliance with the "Medium-term Research and Development Plan for Deep Repository Siting" programme. The main objective of the project, launched in 2014, is to interpret primary data, gather information, and formulate models and further arguments for the preparation of a number of safety analyses to be used in the assessment of the long-term safety of repository siting at all the potential sites. The main part of the project consists of the development of 3D structural-geological, hydrogeological and transport models for all the selected sites and the development of a model safety analysis. Geological, hydraulic and transport models form the basis for the safety assessment of repository construction at specific sites. Information obtained from the models will enhance geological investigation work at the sites concerned and assist in determining the positioning of deep boreholes which will be drilled in the advanced stages of geological investigation so as to provide for the updating of the research and development programme for the selection of the site most suitable for the safe disposal of spent nuclear fuel. 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 the engineered barriers and the migration parameters of the barriers and the rock environment.

Generic Research for DGR Development

A generic research programme, the objective of which is to gather data, arguments and input documentation for the assessment of the feasibility of deep repository construction at candidate sites as well as proof of overall DGR feasibility, is underway at SÚRAO´s underground facilities and via participation in other relevant projects (e.g. at the Grimsel Test Site in Switzerland). It is important to mention that the unique data required for DGR development can be obtained only via research conducted in underground laboratories. To date, every successful research programme has been based on experiments and data obtained in such laboratories. In Europe, laboratories for the development of deep repositories in crystalline rocks exist in Switzerland (the laboratory operates on a fully commercial basis) and in Sweden – the Äspö laboratory has been used for the DGR programmes of both Sweden and Finland. Äspö has now reached its full development potential due to the transition of both countries to the repository construction phase. SÚRAO has gained valuable methodological experience via participation in a number of projects at both the above laboratories and the increasing usage of its own laboratories in the Czech Republic. The Josef Underground Research Facility, situated approximately 50 km south of Prague, is one such facility operating in the Czech Republic. Situated in an abandoned mine, the Faculty of Civil Engineering of the Czech Technical University in Prague opened this underground laboratory, the maximum depth of which is 150 metres, in 2007. The northern part of the facility, known as "Mokrsko-Západ", consists of granitoid rocks. SÚRAO uses this facility primarily for demonstration experiments aimed at proving engineered barrier viability and behaviour (e.g. the construction of an experimental sealing plug as part of the DOPAS project) and in-situ experiments which model the thermal stress of bentonite of Czech origin, e.g. the Mock-Up Josef experiment.

A second facility, the Bedřichov tunnel, situated in the Jizerské mountains and consisting of a water supply conduit is also employed for in-situ granitic rock monitoring purposes. The tunnel, bored through granite of the Krkonoše-Jizera pluton, is 2600 metres long and is located at a depth of up to 150 metres below the surface. Research conducted at the facility primarily concerns special hydrogeological study methodologies and related numerical modelling as well as the long-term monitoring of selected characteristics of the rock mass.

The most important underground facility, however, in terms of research on the future development of the Czech DGR, consists of the Bukov Underground Research Facility (URF).

Bukov Underground Research Facility

General information

The underground part of the Bukov URF, situated at a depth of 550 m beneath the earth's surface, is used as a testing facility for the assessment of the behaviour of the rock environment at a depth similar to that envisaged for the construction of the future deep geological repository. A project proposal for the construction of the Bukov URF was considered by SÚRAO´s Board at the beginning of 2013 and information on its progress is provided on a regular basis in SÚRAO's Annual Reports. SÚRAO´s Board recommended the implementation of the Bukov URF construction project during discussions on SÚRAO's annual plans of activities and budget.

The underground facility is situated within the municipality of Bukov in the district of Žďár nad Sázavou. In a similar way to other facilities of this type, the Bukov URF utilises the infrastructure of a pre-existing underground facility, particularly parts of the Rožná uranium mine in which a number of experimental galleries have been driven (Fig. 1). The galleries, which are situated in the southern part of the Rožná uranium mine complex on level 12 of the B-1 mine working, have a total length of 485 metres. The URF is connected with the surface via the B-1 mine working.

The Bukov URF project consists of three stages:

1) Construction (2013–2017)
2) Characterisation (2015–2017)
3) Experimental stage (2017 up to the construction of a confirmatory laboratory at the finally selected DGR site, i.e. post-2030).

In addition to the galleries situated on level 12, other parts of the Rožná mine up to level 24 (at a depth of 1,200 metres) may also be opened up for the conducting of research projects in the future.

The research programme itself, entitled the Research and Experimental Plan (REP), consists of seven basic parts, the content of which was defined on the basis of SÚRAO strategic documentation.

REP 1 Pilot characterisation of the rock mass for the verification of the methodology for the creation of site models

This programme concerns activities aimed at collecting descriptive geological data, its database storage and subsequent interpretation in the form of 3D models. The experimental cycle was carried out in parallel with the construction of the underground facility. The research programme involves the collection of unique support geological data to be used for the description of the rock environment, the provision of the information required for the assessment of potential sites for deep repository construction and the validation of methodologies used for the description of the rock environment.

REP 2 Testing of methods employed for the long-term monitoring of processes occurring at repository depth

This experimental cycle will involve the development of methodologies, the construction of an infrastructure and the evaluation of long-term data based on continuous and campaign-oriented sampling research. The implementation of this experimental cycle will commence in 2018.

REP 3 Testing of models of groundwater flow and radionuclide transportation in the fractured rock environment of the DGR

This experimental cycle, the commencement of which is planned for 2018, concerns the verification of the practicality and accuracy of the measurement of the various water flow mechanisms considered.

REP 4 Testing the influence of the rock environment at repository depth on changes in the properties of the engineered barriers

This experimental cycle is concerned with the verification of the material characteristics, the estimation of the degradation rate and the interaction of the materials used in the disposal system and waste disposal package technologies under real conditions. Research work commenced in 2017.

REP 5 Testing the occurrence and development of EDZ/EdZ in crystalline rock at repository depth

This experimental cycle concerns the influence of the extent and character of the excavation damaged (EDZ) and excavation disturbed (EdZ) zones on the methods to be employed for the construction of the underground complex of the future DGR. The commencement of this experimental cycle is planned for 2019.

REP 6 The research of the influence of the rock mass on the construction of individual underground workings of the deep geological repository

Experimental Programme 6 will focus on the development of new construction methods with concern to the underground workings of the DGR and their optimisation in terms of both time and financial considerations. The commencement of this experimental cycle is planned for 2022.

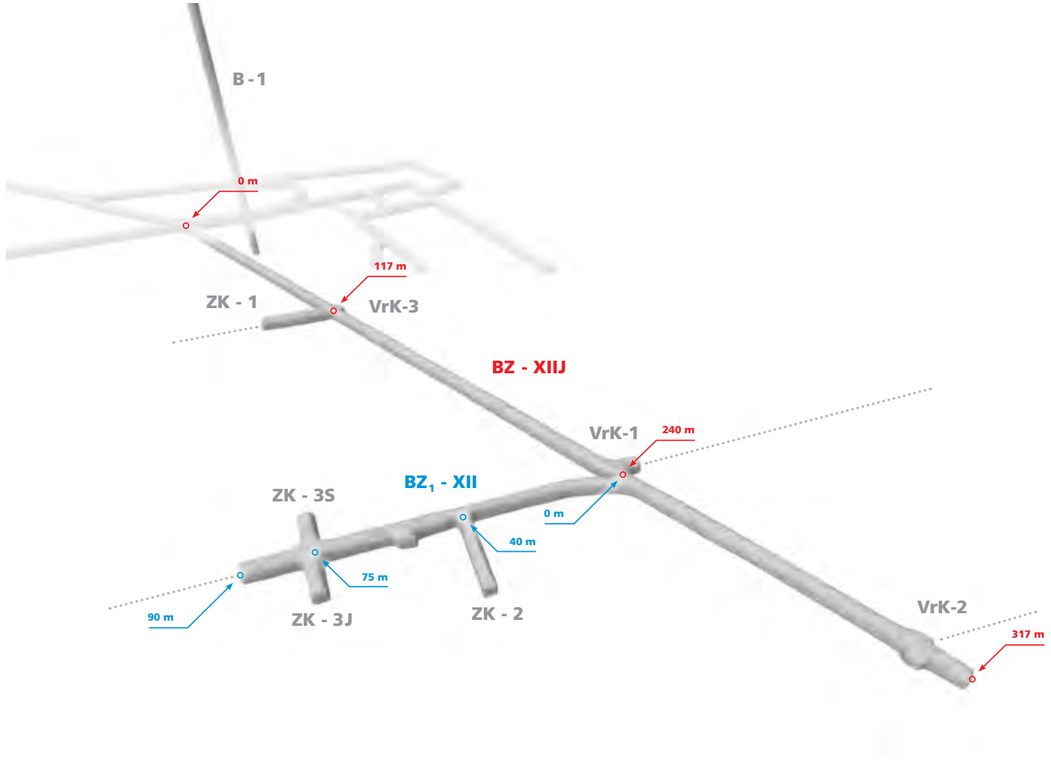
REP 7 Demonstration experiments

Comprehensive experiments will be performed in this cycle to test the behaviour of individual elements of the disposal system at the real scale and under real conditions that will prevail in the future deep geological repository. Attention is devoted to the testing of handling technologies, the construction of experimental models and process monitoring. The commencement of the experimental cycle is planned for 2022.

URF Bukov

Ensuring Bukov URF operation

Following the termination of uranium mining, it was not possible to simply separate the Bukov URF from the rest of the Rožná mine due to the layout of the underground complex. Therefore, once mining activities ceased, it was necessary to continue maintaining the mine infrastructure. During 2016 maintenance work covered the pumping out of mine water via the cascade pumping systems of the individual mine workings, the continued operation of mining equipment and individual mine workings, the power supply and mine ventilation.

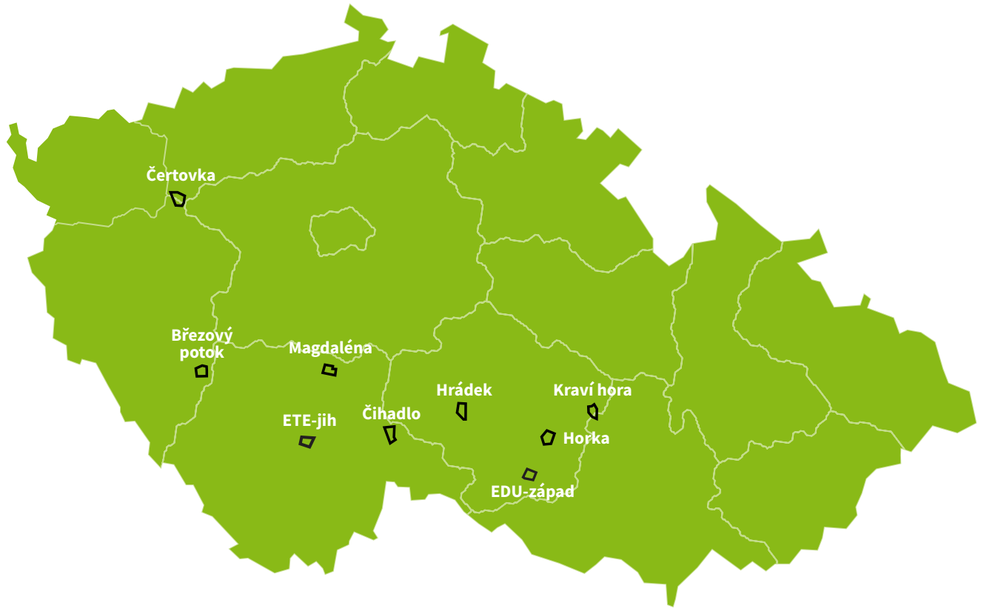


↑ Scheme of the Bukov URF underground galleries

↑ Bukov URF Underground Areas

Search for a suitable site

SÚRAO is working hard on the preparation and construction of a deep geological repository (DGR) for high-level waste and spent nuclear fuel.



Spent nuclear fuel and high-level nuclear waste already exist in the Czech Republic and every year a further 100 tonnes or so of such waste is generated. Spent nuclear fuel is currently stored at interim storage facilities within the respective nuclear power plant complexes. The design of the deep repository takes into account the spent fuel from the operation of the country's existing two nuclear power plants as well as planned new nuclear sources. This information forms the basis for the determination of both the technical design of the facility and the amount of spent fuel to be disposed of, which is expected to amount to around 9 000 tonnes.

Choosing the right location is of crucial importance with respect to the construction of deep geological repositories. The site must fulfil not only safety requirements with respect to the properties of the host rock but also a number of other, no less important requirements including, for example, the technical feasibility of the construction of the surface complex of the repository, road and/or rail accessibility and public acceptance of the repository.

The first study concerning the assessment of the potential of the rock environment in the Czech Republic was conducted in the 1990s.

Currently, SÚRAO is investigating seven sites for the potential construction of a deep geological repository and is also verifying a number of alternative locations, primarily areas surrounding the country's two nuclear power plants.

Deep geological repositories for high-level waste and spent nuclear fuel can only be constructed and operated following the credible demonstration of their safety.

As part of the development of the deep geological repository project, SÚRAO is involved in a number of domestic and international research and demonstration projects, the aim of which is to obtain information on the feasibility of the repository and the long-term behaviour of the disposal system and the surrounding rock massif under a range of different conditions.

International Projects

International institutions coordinate a number of events concerned with the field of radioactive waste management, instigate new legislative and regulatory procedures and, not least, create a meeting place for professionals and the exchange of information. It is, therefore, of the utmost importance to maintain contacts and to engage to a reasonable extent in the activities of these institutions, particularly those activities organised under the umbrella of the IAEA, OECD/NEA and EC.

International cooperation is of particular importance in terms of research and development concerned with deep geological repositories, and a number of countries (e.g. Sweden, Finland, France and Switzerland) are well advanced in this respect. SÚRAO takes every opportunity to link up with those organisations which can offer both experience and know-how. For this reason, SÚRAO has signed an agreement with the Finnish company Posiva Oy in a consortium with Saanio & Riekkola Oy.

Participation in the IGD-TP platform (Implementing Geological Disposal of Radioactive Waste Technology Platform), which has identified strategic priority research and development topics for the forthcoming time period including the implementation of the EU's first deep geological repositories planned for 2025 (Sweden, Finland and France) has proven particularly important in this respect.

SÚRAO enjoys direct and active representation in the IGD-TP Executive Group and is also actively involved in a number of other projects as well as the preparation of an EU joint programme for the development of the technical and technological design of DGRs (Joint Programming).

SÚRAO is also involved in the MoDeRn European project concerned with setting the targets of a monitoring programme for the deep geological repository.

The CAST project involving the study of the behaviour of carbon-14, one of a group of critical radionuclides, under deep geological repository conditions is supported by the European Commission.
In addition, Czech specialists are involved in projects organised by the IAEA and the OECD/NEA with the participation of non-EU countries including the USA, Canada, Japan, South Korea, China and Switzerland. In 2017 SÚRAO was nominated as a leading member of the Crystalline Club under the OECD/NEA. This working group consists of more than 30 experts from 6 countries which are considering crystalline formations as the potential DGR host rock.

The LTD – Long Term Diffusion – experiment, concerned with the retardation of the transport of radionuclides via rock fractures into the crystalline rock matrix, constitutes a globally unique experiment involving the study of radionuclide behaviour in the natural environment. A further two projects are currently underway involving SÚRAO´s participation one of which is 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 involves the long-term assessment of the speed of, and mechanisms surrounding, the corrosion of materials under real rock mass conditions (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.

During the year, SÚRAO continued cooperation with NAGRA on a project entitled the "Use of Experience of the Swiss Grimsel Underground Laboratory (Grimsel Test Site – GTS)" with the conducting of experiments at the Bukov URF. SÚRAO will benefit significantly via the transfer of practical and long-term experience concerning the preparation of research activities, experiment realisation and underground facility operation.

The EBS Task force 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 objective of the ongoing Decovalex 2019 international project is to validate the computing tools used in the modelling of near-field processes and to develop tools for the modelling of related processes which are expected to occur in deep geological repositories.

Public Relations

As in previous years, SÚRAO´s public relations activities focused on improving the level of awareness of the existence of radioactive waste in the Czech Republic and its safe disposal. SÚRAO aims to provide sufficient relevant information and to maintain and strengthen mutual confidence, understanding and respect between SÚRAO and the public and to fully meet all its social responsibilities.
Public relations with respect to the currently operational Richard near Litoměřice, Dukovany and Bratrství near Jáchymov repositories primarily concerned the operation of local information centres, the distribution of information materials and regular meetings with local public representatives. Some information meetings are held as part of regular sessions held by so-called civil safety committees (the Richard Civil Control Committee and the Dukovany Civil Safety Committee), while others are held at the request of local councils.
The Bratrství Civil Control Committee was established during the year in the town of Jáchymov. The main reason for the creation of these commissions is related to our ongoing efforts to strengthen mutual confidence between the public, currently operational repositories and SÚRAO as the managing authority. The main task of the commissions is to carry out independent checks of the operation of radioactive waste repositories, to compare the results with relevant international practice and to provide the public with information on the knowledge gained. Members of the commissions consist of representatives of the communities concerned and their surroundings and specialists from SÚRAO and the relevant Mining Authority.
On the second Saturday in September the Richard repository for the storage of low-level and intermediate-level waste held an open day for those interested in visiting the facility. The almost two hundred attendees were reassured that radioactive waste is disposed of in this former limestone mine under very strict safety conditions. The open day marked the first time in its over fifty-year history that the repository was open to the public. SÚRAO´s main aim was to demonstrate to visitors that the Richard repository poses no threat to its surroundings and to explain how the radioactive waste acceptance and disposal process works.
Direct communication with the public concerning the development of the deep geological repository focused in 2017 mainly on the provision of information to the public on current geological investigation work carried out at the 9 localities pre-selected as suitable for deep geological repository siting.
SÚRAO organised several information meetings with the chairpersons and other representatives of town councils including a number of those in the vicinity of the Dukovany and Temelín NPPs where geological research is underway with the aim of collecting relevant data on selected geological and other criteria. SÚRAO is committed to keeping all the relevant municipal authorities fully informed on the progress of current research and the results thereof via joint meetings or by post.
Similar meetings were held with the chairpersons of town councils in the other 7 sites potentially eligible for the construction of the deep geological repository, at which they were informed of the current situation with respect to the development of the DGR project.
The 2017 annual excursion provided council chairpersons from municipalities in the vicinity of the Dukovany and Temelín power plants with the opportunity to visit the Centre de l'Aube deep geological repository in France. Participants were appraised of the radioactive waste disposal system in France and visited the Bure underground laboratory located at the site selected as most suitable for the construction of the French deep geological repository.
SÚRAO continued the publication and distribution of its "News from SÚRAO" quarterly newsletter to individual households and local councils at all the deep geological repository candidate sites.
A socio-economic analysis of the EDU-West and ETE-South candidate sites commenced in 2017 with the aim of collecting data for the assessment of the sites in terms of various socio-economic aspects in the communities concerned. The analysis is focusing on the economic and social concerns of individual communities at the sites (the analysis of the composition of the population, infrastructure, services, property prices, etc.); a descriptive study will subsequently be compiled on the basis of the results which will provide a detailed description of individual sites. These analyses, which are considered as being of prime importance by SÚRAO, will contribute to the future decision-making process on DGR construction.
SÚRAO utilises all possible communication channels – from the publication of its "News from SÚRAO" and press releases through

a new website and social network profiles to information corners and centres throughout the country. SÚRAO also organises regular presentations for elementary and secondary schools so that even the youngest generations obtain a basic awareness of the various issues involved. Its main information centre was visited by nearly 1,000 students from secondary and elementary schools in 2017 and nearly the same number of students were provided with information in their classrooms as part of SÚRAO´s extensive educational programme.

SÚRAO has a statutory obligation to provide information according to Act 106/1999 on free access to information. 7 applications for information under the Act were received during 2017.

Provision of information to the public during 2017 according to Act 106/1999 on free access to information

Number of applications for information under the Act	7
Number of appeals against a ruling	1
Conclusions of proceedings on sanctions for infringement of the Act	-
Other information concerning the implementation of Act 106/1999	-

Provision of information to the public according to Act 123/1998 on the right 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	-

Managerial, Technical and Administrative Matters

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

Administration of Nuclear Account Fees

The administration of Nuclear Account fees was governed in 2017 by the Atomic Act, Articles 118-135 and Government Decree 35/2017 on the one-off payment tariff for radioactive waste disposal and on annual contributions to local communities as well as the manner of payment, and by Act 280/2009, the Tax Code.

REGULAR PAYMENTS BY PRODUCERS OF RADIOACTIVE WASTE FROM NUCLEAR AND RESEARCH REACTORS

Pursuant to the Atomic Act, Article 122 ČEZ contributed CZK 1,558,642 thousand in 2017 and the yearly contribution made by the Research Centre Řež amounted to CZK 1,200 thousand. Both amounts were paid in regular monthly instalments which were deposited directly in the Nuclear Account.

PAYMENTS BY OTHER PRODUCERS OF RADIOACTIVE WASTE

Other waste producers 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 2017 amounted to CZK 13,334 thousand.

Nuclear Account assets as at 31 December 2017 amounted to CZK 26.9 billion at Government long-term bond nominal value. Disposable funds in the Nuclear Account were invested by the Ministry of Finance in the financial market (in compliance with the Atomic Act, Article 116). Revenue received from financial investment totalled CZK 364.3 million.

Auditing Licensees' Decommissioning Reserves

SÚRAO is responsible, according to the Atomic Act, for ensuring that relevant licence holders honour their obligation to create financial reserves for the future decommissioning of their facilities. The new Atomic Act 223/2016, which came into effect on 1 January 2017, defines this responsibility in Article 113, paragraph 4g.

Audits conducted in 2017 concerned the previous year and, thus, were conducted according to previously valid legal regulations at organisations which were found to meet the following conditions:

- the organisation concerned is obliged to accumulate decommissioning reserves;
- the verified decommissioning cost estimate exceeds CZK 300,000;
- the organisation is in possession of certification verifying its decommissioning cost estimate;
- the organisation is an SÚJB licence holder and its proposal for the method to be employed for the decommissioning of the respective facility has been approved.

Audits were conducted of 12 licence holders covering a total of 34 facilities (under the same rules as in previous years) aimed at verifying the accumulation of financial reserves. The audits were

performed in full cooperation with the respective licence holders and requests by SÚRAO for supplementary documentation were duly met. No serious breaches were discovered during the audits. Reports on the audits performed of individual licence holders containing basic information on the relevant audit were subsequently compiled. A comprehensive report summarising basic information on audits of the accumulation of financial reserves was duly submitted to the SÚJB and the Ministry of Industry and Trade.

Occupational Health and Safety Protection; Fire Safety

Full compliance with occupational health and safety protection regulations makes up an integral part of the Integrated Management System as well as one of the professional responsibilities of senior employees at all levels of management. Such employees are required to undergo regular training on the relevant issues by specially trained persons. The aim of the scheme is to ensure the safe operation of SÚRAO's facilities with no negative impact on the health and safety of employees in accordance with the relevant legislation and internal regulations.

Entry and regular training courses for new employees and existing staff respectively relating to occupational health and safety protection are organised at set intervals.

Fire codes have been drawn up for all of SÚRAO's facilities which define the basic principles of fire protection. The action to be taken by employees or other persons in case of fire are defined in fire alarm directives which have been made available to all employees. The position of fire protection officer has been established at both the Richard and Bratrství repositories.

Comprehensive inspections aimed at verifying strict adherence to rules and regulations relating to health and preventive inspections of safety at work were carried out at all SÚRAO's facilities during the year with the cooperation of the local mining authority where relevant.

No work-related injuries to company employees, emergency situations or breaches of requirements laid down by generally binding regulations occurred at SÚRAO's facilities during the year.

Personnel, Material and Technical Matters

The plan of activities for 2017 contained 66 approved work positions. 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 fulfilled its obligation as set out in Act 435/2004 (the Employment Act) concerning the procurement of goods and services. SÚRAO has established a cultural and social fund in compliance with Regulation 114/2002, which is used to assist its employees in terms of the cost of meals, state contributory supplementary pensions and contributions to cultural and sports events.

Since the end of 2000 SÚRAO's headquarters have been located in a completely refurbished Interior Ministry building at Dlážděná Street 6, Praha 1 and, since mid-2016, it has leased additional office space at the Timber Research and Development Institute's building at Na Florenci Street 7–9, Prague. SÚRAO acquired the office technology and company cars required in order to meet its various responsibilities.

Financial Management

SÚRAO's activities are financed primarily from the Nuclear Account and state budget funds in compliance with the Atomic Act, Article 113, paragraph 6 which sets out rules for the management of radioactive waste disposed of prior to 1 July 2017 and making up an old radiation burden.

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 are deposited in the Nuclear Account.

Utilisation of Budget Funding in 2017 (CZK thousand)

Item No.	Item	Approved budget	Adjusted budget	Budget utilisation	Utilisation percentage
5	Current expenses	278,210	290,822	279,248	96,0
532	Non-investment transfers to municipal budgets	84,000	96,000	96,000	100,0
6	Capital expenses	249,590	237,590	231,662	97,5
	Total expenses:	527,800	528,412	510,910	96,7

Expenses are subdivided into current expenses and capital expenses. In addition to items included in mandatory indicators, expenses concerning purchases and services relating to repository operation and those ensuing from external consultancy, telecommunications and administration services are included in current expenses. Expenses relating primarily to the DGR programme including research and development work, the reconstruction of existing repositories and expenses resulting from other partial investment purchases are included in capital expenses. A detailed review of the utilisation of budget funding by individual item, accompanied by a commentary, was submitted to SÚRAO's Board as required.

The balance sheet is shown in Annex A, the profit and loss account in Annex B.

Evaluation of SÚRAO´s Performance

SÚRAO met its responsibilities for the safe and reliable operation of Czech radioactive waste repositories during 2017 as defined in the Atomic Act. Preparations continued for the development of a deep geological repository in which high-level radioactive waste and spent nuclear fuel will be disposed of in the future. Concerning the efficient utilisation of budget funds allocated to external subcontractors, SÚRAO complied with the provisions of Act 134/2016, on the procurement of public contracts. Funds were employed efficiently and in compliance with the budget in order to fully meet the targets set out in the yearly plan of activities.

20 years SÚRAO

Annexes

A. **Balance Sheet**
B. **Profit and Loss Account**
C. **Auditors´ Report Including the Auditors´ Opinion**

Annex A: Balance Sheet as at 31 December 2017 (CZK Thousand)

			Current period		Previous period
		Gross	Correction	Net	
ASSETS		1,366,531	445,914	920,617	753,102
a.	**Fixed assets**	**1,351,790**	**445,914**	**905,876**	**723,575**
I.	Intangible fixed assets	846,406	291,212	555,194	376,037
II.	Tangible fixed assets	498,776	154,702	344,074	347,524
III.	Long-term financial assets	0	0	0	0
IV.	Long-term receivables	6,608	0	6,608	14
b.	**Current assets**	**14,741**	**0**	**14,741**	**29,527**
I.	Stocks	392	0	392	1,038
II.	Short-term receivables	1,619	0	1,619	543
III.	Short-term financial assets	12,730	0	12,730	27,946
LIABILI-TIES		920 617			753,102
c.	**Equity capital**	**889,731**			**700,096**
I.	Owned capital and adjustments	860,966			861,752
II.	Financial funds	3,216			2,288
III.	Profit/Loss account	-524,935			-203,520
IV.	Budget management income and expenditure account	550,485			39,575
d.	**Other sources**	**30,885**			**39,575**
I.	Reserves	0			0
II.	Long-term payables	1,858			0
III.	Short-term payables	29,027			53,006

Annex B: Profit And Loss Account as at 31 December 2017 (CZK Thousand)

č. pol.	Název položky	Current period Main activity	Previous period Main activity
A.	**Total expenses**	**335,046**	**237,643**
I.	Expenses from activities	226,197	128,973
II.	Financial expenses	44	152
III,	Transfer expenses	108,806	108,517
IV.	Shared tax expenses	0	0
B.	**Total revenues**	**13,630**	**208,251**
I.	Revenue from activities	13,600	24,426
II.	Financial revenue	30	0
III.	Revenue from taxes and charges	0	0
IV.	Transfer revenue	0	183,825
V.	Revenue from shared taxes	0	0
VI.	SURPLUS / DEFICIT		
1.	Surplus / deficit before tax	-321,416	-29,391
2.	Surplus / deficit after tax	-321,416	-29,391

Annex C: Auditors´ Report Including the Auditors´ Opinion – Abridged

Auditors´ Opinion

We have audited the financial statements of the Radioactive Waste Repository Authority (SÚRAO) (also referred to as the "Organisation") prepared in compliance with the accounting regulations effective in the Czech Republic and comprising the balance sheet as at 31 December 2017, the profit and loss account as at 31 December 2017, and annexes to the financial statements which include other explanatory information relating to the accounting entity concerned – a state organisational unit.
In our opinion, the financial statements give a true and fair view of the assets and liabilities of the Organisation – the Radioactive Waste Repository Authority /SÚRAO/ as at 31 December 2017 as well as the costs, revenue and profit/loss for 2017 in compliance with the accounting regulations effective in the Czech Republic.

Basis for the Auditor's Opinion
The audit has been conducted in accordance with the Czech Auditor Act and the standards of the Czech Chamber of Auditors which comprise International Standards on Auditing (ISA) supplemented and modified by related application clauses. Our responsibility defined by these regulations is described in more detail in the Auditors' Responsibility for Auditing the Financial Statements section. In accordance with the Auditor Act and the Code of Ethics adopted by the Czech Chamber of Auditors, we are independent of the Organisation and have fulfilled other ethical obligations arising from these regulations. We believe that the probative information collected gives an adequate basis for forming our opinion.

Other Information Provided in the Annual Report
Other information means all information provided in the Annual Report in addition to the financial statements and the Auditor's Report. The management of the Organisation is responsible for any other information provided.

MANAGEMENT RESPONSIBILITY FOR THE FINANCIAL STATEMENTS
The management of the Organisation is responsible for compiling financial statements which provide a true and fair view in accordance with the accounting regulations effective in the Czech Republic and for such an internal control system which the management regards as necessary for the compilation of financial statements that are free from material misstatement, whether due to fraud or error.

AUDITORS' RESPONSIBILITY FOR AUDITING THE FINANCIAL STATEMENTS
Our objective is to gain reasonable assurance that the financial statements are free from apparent material misstatements due to fraud or error and to issue an auditor's report containing our opinion.
Our responsibility is to identify and assess the risks of the significant (material) misstatement of the financial statements due to fraud or error, to design and implement audit procedures to address these risks and to obtain sufficient and appropriate probative evidence to provide a basis for expressing our opinion. It is also our responsibility to assess the appropriateness of the accounting rules applied, the reasonableness of the accounting estimates made and the information the management of the Organisation stated in the Annex to the financial statements.

Pavla Císařová
auditor,
Czech Chamber of Auditors registration number 1498

SÚRAO's Board

SÚRAO´s Board is an advisory body established by the Ministry of Industry and Trade. The main task of the Board is to supervise the cost-effective and efficient use of funds. Board members are appointed by the Minister of Industry and Trade and include representatives of state administration authorities, radioactive waste producers and the public.

SÚRAO Board Membership

Ms. Lenka Kovačovská (Deputy Minister)
Energy sector at the Ministry of Industry and Trade

Mr. Bohdan Zronek (Senior Vice Chairperson)
Head of the Nuclear Energy Division at ČEZ

Mr. Vítězslav Jonáš (Deputy Vice Chairperson)
Chairman of the "Energy Třebíčsko Region" Association;

Mr. Martin Holý
Director of the Geology Department at the Ministry of the Environment;

Ms. Hana Slavíčková
Advisor to the Deputy Minister for public budgets at the Ministry of Finance;

Mr. Vladimír Černý
Chairman of the Rouchovany town council;

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

Mr. Bronislav Grulich
Chairman of the Jáchymov town council;

Mr. Ladislav Štěpánek
Head of the Conventional Energy Division at ČEZ;

Mr. Karel Křížek
Managing Director of ÚJV Řež;

Mr. Radek Trtílek
Head of the Chemistry of the Fuel Cycle and Waste Management Division at ÚJV Řež

Prof. Radim Blaheta
Head of the Institute of Geonics of the Czech Academy of Sciences

Mr. Martin Ďurdovič
Institute of Sociology of the Czech Academy of Sciences

Contacts

SÚRAO´S MANAGEMENT

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Abbreviations Used

ČBÚ: Czech Mining Authority
ČGS: Czech Geological Survey
ČVUT: Czech Technical University in Prague
DGR: deep geological repository
DOPAS: pan-European Full-scale Demonstration of Plugs and Seals Experiment
EDZ: excavation damaged zone
EdZ: excavation disturbed zone
HBZS Most: Principal Mining First-Aid Station in Most
IAEA: International Atomic Energy Agency
NPP: nuclear power plant
OECD/NEA: Nuclear Energy Agency of the Organisation for Economic Co-operation and Development
OP PIK: PIK operational programme
RQD: rock-quality designation
RW: radioactive waste
SKB: Swedish Nuclear Fuel and Waste Management Company
SRB: sulphate reducing bacteria
SÚJB: State Office for Nuclear Safety
SÚRAO: Radioactive Waste Repository Authority
THM: thermal-hydro-mechanical model
ÚJV Řež: Nuclear Research Institute Řež
URF: Underground Research Facility

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