Annual Report

Radioactive Waste Repository Authority (SÚRAO) 2020

SÚRAO

Prague 2021

Mission and principles of the activities of the Czech Radioactive Waste Repository Authority (SÚRAO)

The Czech Radioactive Waste Repository Authority (SÚRAO) is a state organisational unit and, as such, its activities and management are regulated by Section 113 of Act No. 263/2016 Coll., the Atomic Act. SÚRAO's mission is to ensure the safe disposal of current and future radioactive waste in accordance with requirements concerning nuclear safety and the protection of the population and the environment.

The annual report is submitted for approval to the government of the Czech Republic via the Minister of Industry and Trade in accordance with the provisions of Section 210 b) of the Atomic Act.

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Contents

1 Current situation concerning radioactive waste disposal

Low- and intermediate-level waste from the nuclear energy sector is disposed of in a surface repository located within the Dukovany nuclear power plant complex; the repository was put into operation in 1995. The total volume of the disposal space of 55,000 m^3 (around 180,000 waste drums) is sufficient for the disposal of all the waste (provided that it meets defined waste acceptability conditions) generated by the Dukovany and Temelín power plants, even in the case of the extension of the operation of the two power plants.

Low- and intermediate-level waste (LLW and ILW) from the industry, research and healthcare sectors is disposed of at the Richard (near Litoměřice) and Bratrství (near Jáchymov) near-surface repositories; moreover, the Dukovany repository can also be partially used for this purpose.

The Richard near-surface repository is located in the former Richard II limestone mine complex (below the Bídnice hill). Institutional waste has been disposed of here since 1964. The total volume of the reconstructed underground areas exceeds 17,000 m^3, and the waste disposal capacity makes up approximately half this volume (the rest consists of service corridors). The robustness of the natural barriers of the facility and the existence of additional former limestone mining areas create ideal conditions for the disposal of radioactive waste both now and into the future.

The Bratrství near-surface repository is intended exclusively for the disposal of radioactive waste containing only naturally-occurring radionuclides. The disposal facility was created by adapting one of the mining tunnels of the former Bratrství uranium mine and comprises 5 chambers with a total volume of approximately 1,200 m^3. It was put into operation in 1974. Nearly all the capacity of the repository has now been filled and its gradual closure is anticipated.

The operation of all the repositories, including the monitoring of the now-closed Hostim repository, is ensured by SÚRAO in accordance with the relevant permits issued by the State Office for Nuclear Safety (SÚJB) and, where necessary, in full compliance with the relevant mining regulation permits.

To a lesser extent, long-term low- and intermediate-level waste is generated that is not acceptable for disposal in currently operational near-surface repositories. Requirements have been set concerning the method and quality of the treatment of such waste for interim storage and subsequent disposal in the future deep geological repository (DGR). Such waste is stored both by its producers and by SÚRAO.

High-level waste (HLW) and spent nuclear fuel (SNF) (following its declaration as waste) cannot be disposed of in existing repositories; it is expected that it will be finally disposed of in the future Czech DGR. At present, such waste is stored by its producers, all of whom are holders of an SÚJB permit for the storage of these materials.

2 Operation of the Dukovany radioactive waste repository

The operation of the Dukovany radioactive waste repository (nuclear facility) is provided by ČEZ, a.s. However, the acceptance of waste at the repository and certain other activities, particularly inspection and monitoring, are the responsibility of SÚRAO. The disposal of radioactive waste disposal packages was carried out in accordance with the limits and conditions for the safe operation of the Dukovany nuclear power plant (NPP) and other documents issued by SÚRAO and the supplier, ČEZ, a.s.

As part of the standard operation of the repository, an inspection was conducted during the year of the condition of the buildings and technological equipment, and maintenance work was carried out on the buildings, land, machinery and electrical equipment at the site. In accordance with the relevant SÚJB permits, the levels of nuclear safety, radiation protection and technical safety were reviewed, and the monitoring of the radiation situation and the management of radiation emergencies were ensured at the required standard and, in some cases, enhanced.

In 2020, a total of 1056 waste disposal packages (WDP) (221.9 m^3) were disposed of at the facility. They were disposed of in chamber D3 and, following its reaching full capacity, in chamber D1. Chamber D3 was backfilled with a concrete mixture in October 2020 and closed.

2020, the Dukovany nuclear power plant (EDU) delivered a total of 930 radioactive waste disposal packages (194.2 m^3) for disposal, of which 134 packages with unconsolidated waste (29 box pallets and 105 x 200 l drums) and 796 packages with used ion exchangers and sludges consolidated in an aluminosilicate matrix.

The Temelín nuclear power plant (ETE) delivered a total of 67 radioactive waste disposal packages (16 m^3) for disposal, of which 8 packages with unconsolidated waste (5 box pallets and 3 x 200 l drums) and 59 packages with bituminised items.

With concern to institutional nuclear waste, a total of 59 unconsolidated items of RAW (11.8 m^3) was accepted from ÚJV Řež, a.s.

Preparations continued throughout 2020 for a project for the reconstruction of the Dukovany repository boundary fencing. SÚRAO obtained the SÚJB permit necessary for the project as well as a building permit from the construction department of the Ministry of Industry and Trade. The project will be realised in 2021.

The regular monitoring of the repository and its surroundings in accordance with the approved monitoring programme revealed no exceeding of operating limits and safety conditions during the year.

Two inspections of the Dukovany site by the State Office for Nuclear Safety (SÚJB) also served to confirm the safe operation of the facility.

Basic information on the waste disposed of in 2020 is provided in the following table:

Dukovany repository – operation in 2020:		
Volume of disposed of waste	m^3/waste disposal package (WDP)	221.9/1056
Of which from EDU	m^3/WDP	194.2/930
Of which from ETE	m^3/WDP	16/67
Of which institutional waste	m^3/WDP	11.8/59
Mass of the received waste	tonnes	377

3 Operation of the Richard and Bratrství repositories and the monitoring of the now-closed Hostim repository

In 2020, SÚRAO ensured the operation of the Richard and Bratrství repositories (nuclear facilities) in accordance with the relevant SÚJB and Czech Mining Authority permits. As part of the normal operation of the repositories, the inspection was performed of the condition of the mining areas, and the routine maintenance of buildings, technological systems, machinery, electrical equipment and land quality was conducted. In accordance with the relevant SÚJB permits, the levels of nuclear safety, radiation protection and technical safety were reviewed, and the monitoring of the radiation situation and the management of radiation emergencies were ensured at the required standard and, in some cases, enhanced.

In 2020, 480 WDPs (103.7 m^3) with a total weight of 155.8 tonnes were disposed of at the Richard repository. No packages with radioactive waste were accepted for interim storage. No radioactive waste was disposed of at the Bratrství repository in 2020.

The geotechnical and hydrogeological parameters of both facilities were monitored during the year and the operating equipment was maintained in accordance with safety at work and state professional supervision institution requirements. The radiation monitoring of the repositories and their surroundings was carried out in accordance with the respective approved monitoring programmes. The surroundings of the now-closed Hostim repository were also monitored.

Both of the repositories were subject to inspections by the SÚJB in 2020 (4 inspections at the Richard and 2 inspections at the Bratrství repositories) and the mining supervisory authority (1 inspection at the Richard repository). In one case, SÚJB inspectors discovered violations of set regulations during an inspection of the Bratrství facility. The discrepancy arose as a result of poor communication with a supplier during the evaluation of doses from the internal irradiation of radon conversion products. The supplier evaluated the doses for all persons on the list of those who entered the facility; however, one person on the list did not in fact enter the repository. The shortcoming was addressed via the establishment of an improved supplier communication system. The SÚJB did not impose any sanctions. The other inspections by the SÚJB and the mining authorities did not detect any further violations of legal regulations.

SÚRAO also operates a testing laboratory at the Richard repository site for the testing of so-called special form waste packages used for the transport, storage and disposal of radioactive and fissile materials up to a total weight of 3,200 kg, as well as for the testing of special form radioactive materials according to the relevant test procedures. Four waste package tests were performed in 2020.

As part of the operation of the Richard repository, the management of abandoned radioactive sources and waste was ensured in accordance with Section 91, paragraphs 2b) and 3) of Act No. 263/2016 Coll. SÚRAO fulfils this obligation on the basis of a notification from the SÚJB that the owner of the abandoned source/waste could not be found within the statutory period. The costs of the processing of such waste into a form suitable for storage and subsequent safe disposal are met by the Ministry of Industry and Trade.

The first stage of the reconstruction of the Richard repository continued during the year, including the adaptation of five new disposal chambers aimed at ensuring the availability of sufficient disposal capacity for the next ten years of repository operation. The work is due to be completed in mid-2021.

Basic information on the waste disposed of in 2020 is provided in the following tables:

Richard repository – operation in 2020:		
Volume of disposed of waste	m^3/WDP	103.7/480
Mass of the received waste	tonnes	155.8
Number of waste containers accepted for interim storage	no.	0

Bratrství repository – operation in 2020:		
Volume of disposed of waste	m^3/WDP	0
Mass of the received waste	tonnes	0

4 Development of the deep geological repository for HLW and SNF

The development of the Czech deep geological repository (DGR) continued in 2020 in accordance with the Concept of RAW and SNF Management in the Czech Republic (hereinafter referred to as the "Concept"). The commencement of operation of the facility is expected in 2065. SÚRAO completed the evaluation of nine potential sites for the location of the DGR during the year. The various sites were assessed according to three key criteria: safety, technical feasibility and the impact of the DGR on the environment. The research will continue only at the four preferred sites, initially involving monitoring activities and, from 2023 onwards, via the conducting of geological surveys and research.

Site selection

The Czech Geological Institute selected potentially suitable areas for the location of the deep geological repository as early as in 1992. Following the further assessment of the selected areas in terms of exclusionary and conditional criteria set out in the then valid SÚJB Decree No. 215/1997 Coll. and related legal and other requirements (e.g. the Nature and Landscape Protection Act), 11 potential sites in three different types of rock were selected in 2002. SÚRAO subsequently selected 6 preferred sites, all of which were located in stable crystalline bedrock areas.

Due to the overwhelmingly negative attitude of local inhabitants to the DGR project, SÚRAO suspended all geological research work at the sites until 2009 in agreement with the Ministry of Industry and Trade (the Government took note of this decision via Government Resolution No. 550 of 2 June 2004).

With this factor in mind, sites were subsequently sought where more favourable conditions could be expected in terms of public acceptance. At the end of 2008, based on a government-approved action plan (Government Resolution No. 1315 of 20 October 2008), SÚRAO initiated the study of a number of military areas in terms of the siting of the deep geological repository. The Boletice military area, in which the Chlum reserve site was defined, was then assessed in more detail. However, the further research of this site was terminated due to a number of complex conflicts of interest (the Šumava Protected Landscape Area, the presence of rare fauna, the proximity of the borders with Austria and Germany, etc.). In 2011, a further site, Kraví hora, was defined in the vicinity of the Dolní Rožínka uranium mine.

Based on requirements set out in the Concept, work commenced in 2014 on the "Assessment of Geological and other Information on selected Parts of the Moldanubian in terms of potential Suitability for the siting of the DGR" project aimed at determining suitable rock blocks for the siting of the DGR in the vicinity of the Czech Republic's two nuclear power plants. In 2017, the field research work was completed and potentially suitable rock blocks were identified near to both nuclear power plants.

In 2017, the "Geophysical Work" research project was launched aimed at defining the geological structures of all the DGR candidate sites. The main objective concerned the geophysical verification of both the near-surface and deep geological structures in the wider vicinities of the sites in order to enhance the accuracy of the existing geological models and to reduce the uncertainties thereof. The project was successfully concluded in 2019.

The selection of a site suitable for the construction of the deep geological repository involves a number of phases via which the candidate sites are assessed according to a set of criteria and indicators as defined in the SÚRAO MP.22 document. The criteria are based on both the requirements of Czech legislation and IAEA recommendations. The methodology for the

application of these criteria was developed in the final stage of the assessment process, and was subsequently applied in the assessment and comparison of the sites.

The number of sites was reduced based on an assessment conducted according to the following criteria: technical feasibility, long-term and operational safety and the potential impacts of the construction and operation of the repository on the environment. The output of the assessment conducted in 2020 comprised the recommendation of the following preferred sites: Březový potok, Horka, Hrádek and Janoch (ETE-south) for the next assessment phase. The other sites (Čertovka, Čihadlo, Na Skalním (EDU-west), Kraví hora and Magdaléna) are considered backup sites. For peer review purposes and to facilitate the transparent transfer of information to the sites concerned, the Managing Director of SÚRAO established the so-called Advisory Panel of Experts, which was active from mid-November 2019 to June 2020. The Advisory Panel of Experts assessed all the relevant outputs of the site assessment process conducted by SÚRAO experts and issued a favourable opinion on the recommended reduction of the number of candidate sites. The SÚJB also took a positive position in this respect. The submitted assessment was subsequently approved by the SÚRAO Board following a process audit conducted by the Ministry of Industry and Trade, and in December 2020 the Government of the Czech Republic took official note of the results of the technical assessment. At the same time, the Government approved an update to the Concept that delayed the milestone of the selection of the final and backup sites to 2030 and further ordered the updating of the Territorial Development Policy of the Czech Republic.

The next stage of the research will focus on obtaining knowledge from the expected depth of the repository and the wider surroundings of the four sites, and the interpretation of the data aimed at determining the final and backup sites for the potential location of the DGR. A deeper knowledge of the sites based on information obtained via the conducting of technical research and development will then enable the evaluation and comparison of the two sites and the subsequent recommendation of which site will be the final and which will be the backup choice in 2030.

Research of engineered barriers

The technical design concept of the DGR, including an estimate of the construction and operation costs, formed part of the DGR Reference Project and the update thereof. One of the most important engineered barriers comprises the waste disposal package (WDP). Since 2013, work has been underway on a project, the output of which will consist of the design of materials and a design solution for a WDP for SNF. The project recommended the adoption of two WDP designs, both of which are currently in the design verification phase. In 2020, work continued on the production of a sample real-scale WDP.

The research of the other engineered barriers, i.e. the damping and sealing materials, is underway under both laboratory and real rock conditions. The aim is primarily to verify the stability of Czech bentonites and to determine their behaviour under DGR conditions. Major projects currently include the Interaction experiment (Bukov URF), the Mock-up Josef experiment (Josef underground laboratory), the international HotBent experiment (Grimsel underground laboratory, Switzerland), the EURAD and BEACON international projects and other projects funded by the Technology Agency of the Czech Republic (TAČR), concerning which SÚRAO is the application guarantor.

Project design activities

In 2015, the “Research Support for the Project Design of the Deep Geological Repository” project was announced, to be conducted by a consortium led by the Czech Technical University in Prague. As part of this project (that was underway from 2016 to 2020), research was conducted aimed at optimising the technical design of the most important technological components of the DGR with regard to technical feasibility, operational safety and economic considerations. In addition, the project addressed the environmental characteristics of, and the impacts of the construction and operation of the repository on the candidate sites. Siting studies were prepared

for each of the sites based on the situation with respect to potentially suitable rock blocks according to 3D structural-geological models of defined exploration areas and the assessment of the potential environmental impacts of the construction and operation of the DGR. All the resulting documentation, i.e. siting studies, environmental impact studies and safety reports - operational safety, formed background materials for the subsequent compilation of detailed safety reports focusing on long-term safety. In 2019, the various background reports used in the assessment of the sites with respect to the development of the project design were updated based on data obtained from the conducting of geophysical surveys. The project was concluded in 2020.

Activities concerning the safety assessment of the DGR

In accordance with the Medium-Term Research and Development Plan for the requirements of the siting of the DGR, the six-year "Research Support for the Safety Assessment of the Deep Repository" project was completed in 2020. The main output of this project, which was launched in 2014, concerned the interpretation of primary data obtained from the geological characterisation of the candidate sites and the gathering of information, models and arguments for the preparation of safety analyses for the assessment of the long-term safety of the candidate sites. The most important part of the project comprised the preparation of 3D structural-geological, hydrogeological and transport models for all the sites and the preparation of a model safety analysis. Geological, hydraulic and transport models form the basis for the safety assessment of the construction of the DGR at the potential sites. The information obtained from the creation of such models and the preparation of the model safety analysis will allow for the more accurate focusing of the geological exploration at the sites (especially with concern to the drilling of deep boreholes in the more advanced stages of the geological exploration research) and the updating of the R&D programme concerning the selection of sites for the safe disposal of spent nuclear fuel and other radioactive waste, including the gathering of the necessary information on the properties of the SNF and RAW itself, the long-term stability of the engineered barriers and the migration parameters of both the engineered barriers and the rock environment.

Domestic R&D and demonstration research in underground laboratories for the needs of the DGR programme

The research programme addresses the need to obtain data, arguments and other input documents so as to prove both the feasibility of the DGR at the candidate sites and the long-term safety of the facility via research under both laboratory and underground in-situ conditions. It should be noted that the unique data required for the development of the DGR cannot be obtained other than through underground laboratory research. The success of the DGR project will depend to a great extent on experiments conducted and data obtained in Czech underground laboratories.

SÚRAO has obtained significant methodological experience from participation in a number of projects conducted in foreign underground laboratories and in its own underground facilities in the Czech Republic. SÚRAO's long-term support of research at the Bedřichov tunnel site ended recently and support for a number of in-situ experiments continues in the Josef underground laboratory; however, most SÚRAO research projects are now conducted at the Bukov Underground Research facility (URF). The URF is owned by SÚRAO and it serves for the conducting of research and development projects and demonstration experiments connected with the DGR development programme. The laboratory is located in the former Rožná I uranium mine and makes use of the pre-existing mine infrastructure. The laboratory tunnels and niches are located on level 12 of the mine near to the B-1 pit beneath the village of Bukov, at a depth of around 550 m.

The excavation of the first section of the laboratory, referred to as Bukov URF Stage I, commenced in 2013, and the laboratory facilities were put into full operation in 2017, since which time the experimental phase has been underway. The various areas of the Bukov research programme were defined on the basis of strategic documents compiled by SÚRAO experts, i.e.

the Medium-term research and development plan for the needs of the siting of the deep geological repository in the Czech Republic 2015-2025 and the Requirements, suitability indicators and site selection criteria for the siting of the DGR, legislative requirements (the Atomic Act) and international recommendations. In 2020, work was underway on a total of eight research projects. Project proposals are considered in accordance with the defined SÚRAO experimental plan, which covers a comprehensive range of research areas related to the development of the DGR referred to as REPs (research and experimental programmes): REP1 - Characterisation and creation of geoscience models of the rock environment, REP2 - Long-term monitoring of the rock environment, REP3 - Groundwater flow and the transport of radionuclides, REP4 - Engineered barriers for the DGR, REP5 - Influence of underground construction work in the DGR on the rock environment (EDZ), REP6 - Technological procedures for DGR construction, REP7 - Demonstration experiments. Tenders for the conducting of research projects are published in line with the REP system and according to SÚRAO's current research requirements.

Work commenced during the year on the reconfiguration of the existing mine infrastructure with the aim of optimising the range of the underground spaces concerning both the needs of the laboratory and the minimisation of operating costs. In January 2021, the excavation began of a new laboratory complex referred to as Bukov URF Stage II. The new part of the laboratory will allow for the conducting of research in the coming years principally concerning the DGR-related topics defined in the SÚRAO Medium-term Research and Development Plan for the period 2020 - 2030. The objectives are: 1. Determination of the transferability of knowledge obtained from the surface parts of the rock environment of the Bukov URF to deeper sections for the prediction of the properties of the candidate sites at repository depth, 2. Verification of the propagation of temperature in the repository from sources that simulate disposed of spent nuclear fuel, 3. Verification of the prediction of the transport of mobile radionuclides in the isolation part of the repository, 4. Verification of the properties of the waste disposal package materials in the real conditions of the rock environment, 5. Verification of the prediction of THMC (thermo-hydro-mechanical-chemical) processes in the real conditions of the repository, 6. Verification of the influence of excavation methods on the extent of the damage to the rock (EDZ area) and the isolation capacity of the rock mass.

Government Resolution No. 50/2016, dated 25 January 2016, point IV, paragraph 1, whereby the Minister of Industry and Trade is instructed to ensure the fulfilment of the tasks specified in Chapter 8 of Part III of document No. 1617/15 *(inter alia)*, sets out the following:

a) *SÚRAO shall inform the Government on an annual basis via its Annual Report of the securing of financing for construction purposes for the upcoming period from the relevant operational programme.*

No funds were drawn from the Enterprise and Innovation for Competitiveness operational programme in 2020.

b) *Ensuring that SÚRAO is the established owner of the Bukov URF and entrusting SÚRAO with its management, with the responsibility of meeting set objectives in compliance with the relevant Act and associated regulations. Informing the Government via SÚRAO's Annual Reports on the progress of URF construction and operation.*

As part of the process surrounding the termination of mining activities at the Rožná mine, a contract was concluded in 2017 between SÚRAO and DIAMO (state enterprise) aimed at ensuring the operability and routine maintenance of the Bukov URF. This contract thus guaranteed the operation of those parts of the Rožná mine essential for the operation of the URF and formalised relations between the owner of the URF (SÚRAO) and the mine operator (DIAMO). The contract was concluded for the period up to November 2019 and was subsequently extended via an amendment to the contract up to 2020. In 2020, a detailed review was conducted

of the operation of the Bukov URF followed by negotiations between SÚRAO and DIAMO, the result of which was the conclusion of a contract for the operation of the facility until 2030 with the potential for its extension up to 2035.

c) *Informing the Government via SÚRAO's Annual Reports on the financing of the construction and operation of the underground research facility for which it is not possible to utilise funds from the relevant operational programmes from the Nuclear Account held with the Czech National Bank, accompanied by an evaluation of the effectiveness and efficiency of the use of funds provided in previous years and a statement justifying the funding required for the subsequent period.*

In 2020, all the construction and research projects at the URF were financed from the nuclear account on the basis of long-term contracts. A total of CZK 6.1 million was spent on the expansion of the URF in 2020, and CZK 164.3 million on the operation of the facility. Due to the Covid-19 pandemic, a number of planned activities were delayed or only partially completed; in such cases, they were transferred in terms of substance and costs to the subsequent period. The amendments to the planned schedule will not adversely impact the attainment of the main milestones set out in the affected contracts. With concern to the various research projects currently underway, their progress is in line with the requirements of the Medium-term research and development plan.

International cooperation

International institutions play a number of important roles in the field of radioactive waste management, including the initiation of legislative and regulatory changes and the creation of the conditions for experts to meet and exchange information. It is, therefore, of the utmost importance to maintain international contacts and to participate in the activities of such institutions to the maximum extent possible. SÚRAO's international activities can be divided into three categories.

The first category comprises the membership of international organisations such as the International Atomic Energy Agency and the Nuclear Energy Agency (NEA) of the OECD, both of which have European and non-European member countries such as the USA, Canada, Japan, South Korea and China and Switzerland. In 2017, a SÚRAO member of staff was elected chairman of the Crystalline Club expert group (part of the NEA/OECD), the membership of which comprises more than 30 experts from 6 countries whose DGR programmes are considering crystalline rocks as the potential host environment.

Participation in the IGD-TP (Implementing Geological Disposal - Technology Platform) technology platform is also of significant importance for SÚRAO. The IGD-TP identifies strategic research and development priority areas with the vision of the commissioning of the first deep geological repositories in the EU by 2025 (Sweden, Finland, France). SÚRAO has its own representative in the IGD-TP Executive Group.

The next category consists of cooperation on international projects that are organised and financed by the European Commission as well as international consortia set up to address particular issues. These projects mostly concern research and development.

The EU EURAD project, with the participation of more than 100 organisations, is one of the most important projects in which SÚRAO is involved. The project commenced in 2019 and the first phase is scheduled to last up to 2024. EURAD will address a wide range of topics related to the disposal of radioactive waste. The European Commission attaches particular importance to the project; hence, the participation of organisations from the Czech Republic is seen as both beneficial and of particular significance. The second wave of the EURAD project is currently under

preparation, and is expected to commence in 2021 and continue to 2024. SÚRAO is both actively involved in the project and coordinates the activities of the various Czech third party participants (Czech Technical University, Charles University, ÚJV, a.s., the Institute of Geonics AS CR and the Technical University of Liberec).

A further EU project in which SÚRAO is involved is the BEACON project, which is concerned with the development of bentonite barriers. The aim of the project is to form an understanding of the homogenisation of the bentonite barrier and to identify the requirements for the homogeneity of the barrier from the point of view of long-term safety.

The conducting of joint experiments in foreign underground laboratories (for example the Grimsel Test Site (GTS) laboratory in Switzerland) also yields very valuable research results. The main aim of such experiments is to form an understanding of the processes that will occur in DGRs located in crystalline rocks and to obtain data for safety analysis purposes. Such experiments are usually long term and focus on retarding the transport of radionuclides via diffusion from fractures into the crystalline rock matrix, e.g. the LTD (Long Term Diffusion) experiment, a unique experiment that involves the use of radionuclide tracers in a natural rock environment.

The MaCoTe (Material Corrosion Test) experiment, which also involves the participation of SÚRAO, is concerned with the long-term assessment of the rate and mechanism of the corrosion of waste disposal package (WDP) materials under real rock mass conditions. The experiment involves the testing of materials designed in the context of the WDP research and development programme. A further important project underway at the GTS comprises the Hotbent experiment involving the construction of a bentonite barrier at the real DGR scale and the production of barrier components from Czech bentonite (at the industrial scale). One of the main benefits of the experiment comprises the evaluation of the behaviour of Czech bentonite in a real rock environment and the verification of the corrosion properties of the materials that will make up the Czech waste disposal package under real conditions.

SÚRAO is also active in many other international projects including: TDB 6 (Thermochemical Database Project), SKB Task Force EBS, SKB Task Force GWFTS, DECOVALEX 2019, CIM and BIOPROTA.

The final category consists of bilateral cooperation, via which SÚRAO shares its know-how with other European and global organisations active in the field of RAW management (waste management organisations - WMO) through the conclusion of memoranda of cooperation.

One example of such cooperation comprises an agreement with the Finnish consortium Posiva Oy/Saanio & Riekkola Oy. The aim is to strengthen the Czech DGR development management structure via the involvement of foreign experience, including ensuring the conditions for related research and development work and the development of technical solutions that demonstrate the feasibility and safety of the DGR at the potential sites considered in the Czech Republic. Memoranda of understanding have also been concluded with German and Romanian organisations aimed at sharing best practice on relevant topics.

5 Communication with the public

One of SÚRAO's long-term aims is to increase the general awareness of the existence of radioactive waste and the methods available for its safe disposal in the Czech Republic and abroad. The availability of information on radioactive waste and its management forms a prerequisite for discussions between all the various stakeholders on the method eventually applied for the final disposal of radioactive waste and spent nuclear fuel in the Czech Republic.

Therefore, as every year, SÚRAO's communication activities in 2020 focused on raising awareness of the existence of radioactive waste in the Czech Republic and its safe disposal. In 2020, due to the limitations imposed by the coronavirus situation, SÚRAO focused mainly on providing information via social networks and its websites.

With respect to the areas in which the Richard, Dukovany and Bratrství repositories are located, communication concerned primarily the provision of information on the safe operation of these facilities.

SÚRAO is a member of the Dukovany Civil Safety Committee, and SÚRAO representatives regularly attend meetings of the committee. In recent years, SÚRAO initiated the establishment of so-called civil control committees for its two operational near-surface repositories, Bratrství and Richard. The motivation for the establishment of these committees concerned efforts to strengthen the level of trust between local inhabitants and SÚRAO. The main task of these committees is to conduct independent inspections of the operation of the repositories, to compare them with the relevant international practice and to inform the local public of their findings. The members of the commissions comprise representatives from the affected and surrounding municipalities and the respective regional authorities, as well as experts from SÚRAO and the Czech Mining Authority.

A further key task for the SÚRAO communications department concerns the provision of information to the sites that have been selected for the potential location of the future Czech deep geological repository for the permanent disposal of high-level waste and spent nuclear fuel.

Communication with the public in this respect focused primarily on providing information on the planned reduction in the number of sites based on the long-term collection of data and detailed scientific analysis in the fields of geology, hydrology, geophysics, etc., primarily via the participation of observers from the candidate sites in the Advisory Panel of Experts (established by SÚRAO's Managing Director) the work of which commenced in mid-November 2019 and to which each candidate site was asked to nominate two observers (without voting rights). In addition, the sites were invited to jointly nominate one of the members of the Advisory Panel of Experts (with voting rights). Other members of the panel comprised experts from the Czech Technical University, the Ministry of Industry and Trade, the Ministry of the Environment, Masaryk University, the National Radiation Protection Institute, and SÚRAO. A representative from the State Office for Nuclear Safety was also present as an observer.

The key factors considered in the assessment of the candidate sites comprised safety, technical feasibility and environmental impacts.

On 21 December 2020, the Government approved the selection of four recommended sites for the siting of the DGR: Březový potok in the Klatovy region, Horka between Třebíč and Velký Meziříčí, Hrádek near Jihlava and Janoch near the Temelín NPP. Further research and exploration work will be conducted at these sites aimed at the selection of the final and backup sites, which should be confirmed by 2030.

The Communications Department organises a number of conferences and meetings aimed at supporting international relations, both in the Czech Republic and abroad. In 2020, due

to the coronavirus situation, these events were limited to the Safe and Sustainable Backend of the Fuel Cycle conference, which was held in Prague in September; further information is available at https://ssfc.cz/ssfc-2020/.

SÚRAO also held its annual summer school during the year. The one-week course for students of technical subjects and the natural sciences once again proved to be popular with participants.

SÚRAO continued to publish its quarterly "News from SÚRAO" newsletter, which is distributed directly to all the inhabitants of the candidate DGR sites and the respective municipal authorities.

SÚRAO employs a variety of communication channels, i.e. websites, printed press materials, the media, social network sites, etc.

In 2020, particular emphasis was placed on communication via social networks, especially Facebook and Instagram, on which articles with the latest information from, and interesting facts concerning SÚRAO and developments globally with respect to radioactive waste were published on a regular basis.

SÚRAO also provides lectures for schools so that even the youngest generations are made aware of radioactive waste issues. Whereas in 2020, the number of lectures provided was limited by the coronavirus, we very much hope that it will soon be possible to provide information for groups of young people in person once again both at schools and in our information centres.

SÚRAO is obliged to provide information to the public pursuant to Act No. 106/1999 Coll. on free access to information. In 2020, SÚRAO received 2 requests for the provision of information according to the Act.

Provision of information to the public during 2020 according to Act No. 106/1999 on free access to information:

Number of applications for information under the Act	2
Number of appeals against a ruling	0
Conclusions of proceedings on sanctions for infringement of the Act	-
Other information concerning the implementation of Act No. 106/1999	-

Provision of information to the public during 2020 according to Act No. 123/1998 on the right to information on the environment:

Number of applications for information under the Act	0
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 No. 123/1998	-

6 Managerial, technical, legal 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 the relevant legislation.

Licencing procedures 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 (263/2016) and relevant regulations; changes in documentation primarily concern Regulation No. 377/2016 on requirements for the safe management of radioactive waste and on the decommissioning of nuclear facilities and category III and IV workplaces, as well as Decree No. 422/2016 Coll., on radiation protection and the safety of radionuclide sources.

The licencing procedure for the operation of 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 in 2017 and management system programmes and other documentation were harmonised in 2019. Documentation requiring approval pursuant to Act No. 263/2016 Coll., the Atomic Act, was duly approved by the SÚJB. In 2020, SÚRAO held a total of 11 permits for activities pursuant to Section 9 of 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 standardised by an SÚJB commission are used for safety analysis purposes.

The radiation protection of repository personnel, local inhabitants and the repository surroundings is ensured through fulfilling 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 analyses and approved by the SÚJB.

Radiation protection activities make up one element of the system for the protection of persons and the environment against the potentially detrimental impact of ionising radiation, the main reason behind which is to prevent the release of radionuclides into the environment and the occurrence of radiation 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 and other dose restrictions defined by SÚJB Regulation No. 422/2016, on radiation protection.

The fulfilment of requirements relating to radiation protection as defined by Regulation No. 422/2016 on radiation protection and the safety of radionuclide sources 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 records were maintained of both the doses received by employees and the ionising radiation sources owned by SÚRAO. No radiation

protection breach occurred during the year. SÚRAO cooperated closely with outside contractors working at its repositories in terms of organising training courses on radiation protection and radiation emergency management as well as with concern to regular inspections of compliance with requirements concerning radiation protection at SÚRAO's facilities.

With respect to the fulfilment of its responsibilities regarding radiation protection, SÚRAO cooperated closely with the SÚJB during regular inspections of its facilities and concerning the fulfilment of SÚJB requirements concerning adherence to the limits and conditions of the safe operation of its repositories, RAW management and radiation protection. The requirements of Act No. 263/2016, the Atomic Act and related legislation were met in full.

No radiological emergency event occurred during the year at any of SÚRAO's facilities.

Maintaining records of accepted radioactive waste and nuclear materials

SÚRAO maintains records on accepted radioactive waste and its producers as stipulated by Act No. 263/2016. Such records are maintained in both paper and electronic form. SÚRAO holds an SÚJB licence for the management of nuclear materials. Records of nuclear materials were maintained in full compliance with SÚJB Regulation No. 374/2016, on the registration and control of nuclear materials and the reporting of data on such materials, and other European Community regulations. Nuclear materials are stored at the Richard repository at which the appropriate physical protection level is ensured as required by SÚJB Regulation No. 361/2016. 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.

Management of fees paid to the nuclear account

The administration of fees paid to the nuclear account was governed in 2020 by the Atomic Act, Sections 118-135 and Government Decree No. 35/2017 on the one-off payment tariff for radioactive waste disposal and on the amount of contributions to local communities as well as the manner of payment, and by Act No. 280/2009, the Tax Code.

Regular payments by producers of radioactive waste from nuclear and research reactors

Pursuant to the Atomic Act, Section 122, ČEZ contributed CZK 1,652,319 thousand in 2020 and the yearly contribution made by the Research Centre Řež amounted to CZK 1,322 thousand. Both amounts were paid in regular monthly instalments which were deposited directly into the Nuclear Account.

Payments by other radioactive waste producers

Other waste producers paid their charges on a one-off basis following the 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 on the acceptance of the

radioactive waste accompanied by the relevant waste acceptance documentation. The total sum paid in 2020 amounted to CZK 20,526 thousand. The one-off charges were paid in accordance with the payment assessments.

Nuclear Account assets as at 31 December 2020 amounted to CZK 31.72 billion in cash and the nominal value of Government bonds. Disposable funds in the Nuclear Account were invested by the Ministry of Finance in the financial market in compliance with the Atomic Act, Section 116.

Auditing of licence holder reserves for the decommissioning of their facilities

SÚRAO is also responsible for the inspection of the creation of decommissioning reserves as set out in Act No. 263/2016, the Atomic Act. In accordance with Section 113 (4g) of the Atomic Act, SÚRAO inspects the creation of the decommissioning reserves of those licence-holders who are obliged to create such reserves.

Initial conditions for initiating an inspection:

- the organisation is subject to the requirement to create a reserve according to the Atomic Act (263/2016);
- 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 35 facilities in 2020. The audits followed the inspection process as conducted in previous years and were carried out in compliance with the relevant provisions of the new Atomic Act No. 263/2016 which came into effect on 1 January 2017. The audits were performed in full cooperation with the respective licence holders and requests by SÚRAO for supplementary documentation were duly met. A report on the inspection of decommissioning reserves was provided to each licence holder following the audit; no serious irregularities were discovered. A comprehensive report on the inspection of the creation of decommissioning reserves was discussed by the SÚRAO Board and submitted to the SÚJB in accordance with SÚRAO’s establishment statutes.

Integrated management system

In order to ensure the efficient functioning of the main management and support processes and activities, SÚRAO has introduced an integrated management system that fully takes into account the obligations arising from SÚRAO's management system policy. The management system covers SÚRAO's processes, activities, relationships and employee obligations as well as those suppliers whose products or services impact safety. The integrated management system is maintained and enhanced on a continuous basis and is set up so that the various processes and activities concerned and changes thereto are accounted for in a controlled and verifiable manner.

The priorities of the integrated management system concern primarily nuclear safety, radiation protection, technical safety, the monitoring of radiation situations, the management of radiation emergencies, and ensuring the quality of the outputs of the various processes and activities, pursuant to the Atomic Act No. 263/2016 Coll.

The requirements of the integrated management system are applied via a hierarchical approach according to the significance of the respective processes and activities, with the aim of deploying adequate financial and human resources according to the extent of the risk associated with the failure or malfunctioning of the product. The main activities concerned comprise the following:

- RAW management at the three operational repositories
- the operation of the Richard and Dukovany repository nuclear facilities
- the operation of IV category workplaces at the three operational repositories
- the management of nuclear materials at the Richard repository
- the reconstruction of the IV category workplace at the Richard repository,

for which SÚRAO holds the relevant permits pursuant to Section 9 of the Atomic Act No. 263/2016 Coll.

The various management system programs (MSP) are valid for all the operational RAW repositories at which radioactive waste is handled. These MSPs cover the management systems of authorised holders and the processes and activities involved, including the definition of the responsibilities of the authorised holder and its suppliers. MSPs for the description of systems according to Decree No. 408/2016 Coll. employ the above-mentioned set of governing documents.

Mining safety

The operation of the Bratrství and Richard near-surface repositories is authorised based on licences which allow "specific encroachment into the Earth's crust" issued in compliance with the Mining Act and other licences issued in compliance with the Mining Operations Act.

Both repositories were operated throughout 2020 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.

In 2020, one inspection of compliance with mining regulations was carried out by inspectors from the regional Mining Office in Most.

Occupational health and safety and fire protection

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 qualified persons. The aim 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 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.

In 2020, no work-related accidents, extraordinary events or deviations from the requirements set out in generally binding regulations on occupational health and safety and fire protection occurred at any of SÚRAO's facilities.

Personnel, material and technical issues

In 2020, SÚRAO had a total of 61 regular employment positions. When necessary, certain work for SÚRAO is supplied for the fulfilment of specific tasks or in the form of agreements to perform work and agreement to complete a job. SÚRAO's staff attended various training courses during the year in compliance with legislative requirements; these courses related to obligatory professional training, the further improvement of qualifications and language training.

SÚRAO has established a cultural and social fund in compliance with Regulation No. 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 on one floor and part of the ground floor and basement of an Interior Ministry building at Dlážděná street 1004/6, Prague 1 and, since February 2019, has also rented office space in the Timber Research and Development Institute building at Na Florenci street 7 and 9 according to a contract that authorises

SÚRAO to manage this property. SÚRAO acquires the office technology and company cars required in order to meet its various responsibilities.

7 Financial management

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

SÚRAO is authorised to manage state property and consequently maintains the relevant accounts in pursuance of Act No. 563/1991 on accounting and Decree No. 410/2009 that implements certain provisions of Act No. 563/1991, and according to Act No. 218/2000, on budgetary rules. SÚRAO's budget is determined according to a budget structure defined by Ministry of Finance Regulation No. 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 2020

Item no.	Item (CZK thousands)	Approved budget	Adjusted budget	Budget utilisation	Utilisation %
5	Current expenses	379 930.48	379 930.48	303 745.39	79.95
6	Capital expenses	290 100.40	290 100.40	187 332.54	64.58
	Total expenses:	670 030.88	670 030.88	491 077.93	73.29

Expenses are subdivided into current expenses and capital expenses. In addition to items included in mandatory indicators, expenses concerning purchases and services relating to the operation of repositories and the Bukov URF and those ensuing from external consultancy, advisory and communications services, transfers to municipalities and administration and legal services are included in current expenses. Expenses relating primarily to the DGR development programme including research and development work, the reconstruction of existing repositories and expenses resulting from other 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.

Auditors' report

SÚRAO´s financial statements were subjected to an external audit which was conducted by the 22Hlav auditors company, registered in the list of auditing companies maintained by the Chamber of Auditors of the Czech Republic under registration number 277. The Auditors´ Report is presented in Annex C.

8 Evaluation of SÚRAO´s performance in 2020

SÚRAO met its responsibilities for the safe and reliable operation of Czech radioactive waste repositories during 2020 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 No.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.

9 Annexes

A. Balance sheet as at 31 December 2020
B. Profit and loss statement as at 31 December 2020
C. Auditors' report including the auditors' opinion
D. List of abbreviations

Annex A: Balance sheet as at 31 December 2020 (CZK thousands)

		Current period			Previous period
		Gross	Correction	Net	
ASSETS		**2 113 594,46**	**620 970,66**	**1 492 623,80**	**1 417 189,42**
A.	**Fixed assets**	**2 092 344,00**	**620 902,09**	**1 471 441,91**	**1 406 033,16**
I.	Long-term intangible fixed assets	1 402 639,34	432 533,94	970 105,40	948 670,49
II.	Long-term tangible fixed assets	689 690,69	188 368,15	501 322,55	457 348,70
III.	Long-term financial assets	0	0	0	0
IV.	Long-term receivables	13,96		13,96	13,96
B.	**Current assets**	**21 250,47**	**68,57**	**21 181,90**	**11 156,26**
I.	Stocks	834,40		834,40	418,35
II.	Short-term receivables	1 497,40	68,57	1 428,83	749,00
III.	Short-term financial assets	18 918,66		18 918,66	9 988,91

LIABILITIES		**1 492 623,80**	**1 417 189,42**
C.	**Own capital**	**1 447 934,31**	**1 352 637,37**
I.	Owned capital and adjustments	860 948,19	860 948,19
II.	Financial funds	3 443,86	3 662,94
III.	Profit/loss account (including unpaid losses from previous years)	-1 550 791,39	-1 155 229,43
IV.	Budget management income and expenditure account	2 134 333,65	1 643 255,68
D.	**Other sources**	**44 689,49**	**64 552,05**
I.	Reserves	0	0
II.	Long-term payables	4 063,81	2 024,49
III.	Short-term payables	40 625,68	62 527,55

Annex B: Profit and loss statement as at 31 December 2020 (CZK thousands)

Item no.	Item name	Current period Main activity	Previous period Main activity
A.	**Total expenses**	**420 699,15**	**323 063,17**
I.	Expenses from activities	379 935,52	289 731,68
II.	Financial activities	86,79	147,24
III.	Transfer expenses	40 676,83	33 184,24
IV.	Shared tax expenses	0	0
B.	**Total revenues**	**25 137,19**	**16 008,38**
I.	Revenue from activities	24 787,21	15 975,69
II.	Financial revenue	349,98	32,69
III.	Revenue from taxes and charges	0	0
IV.	Transfer revenue	0	0
V.	Revenue from shared taxes	0	0
VI.	SURPLUS/DEFICIT		
1.	Surplus/deficit before tax	-395 561,96	-307 054,79
2.	Surplus/deficit after tax	-395 561,96	-307 054,79

Annex C: Auditors' report including the auditors' opinion

Auditors' opinion

We have audited the accompanying financial statements of the Czech Radioactive Waste Repository Authority (hereinafter referred to as the "Organisation") prepared in accordance with Czech accounting regulations and consisting of the balance sheet as at 31 December 2020, the profit and loss statement for the year ended 31 December 2020 and the appendix to these financial statements, which provides a description of the significant accounting policies applied and other explanatory information. Details of the Organisation are provided in Note I to the financial statements. In our opinion, **the financial statements provide a true and fair view of the assets and liabilities of the Organisation as at 31 December 2020 and of the costs, revenues and operational results for the year ended 31 December 2020** in accordance with Czech accounting regulations.

Basis for the opinion

We conducted the audit in accordance with the Act on Auditors, Regulation (EU) No. 537/2014 of the European Parliament and of the Council and the standards of the Chamber of Auditors of the Czech Republic, which comprise international standards on auditing (ISA), supplemented and modified by the 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 provides an adequate basis for forming our opinion.

Other Information Provided in the Annual Report

In accordance with Section 2b) of the Act on Auditor information, other information means all information provided in the Annual Report in addition to the financial statements and the Auditors' Report. The Managing Director of the Organisation is responsible for any other information provided.

Managing Director's responsibility for the financial statements

The Managing Director 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 genuine error.

Auditors' responsibility for the financial statements

Our objective is to obtain reasonable assurance on whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that outlines our opinion. While a reasonable level of assurance comprises a high level thereof, it is not a guarantee that the audit performed in accordance with the above regulations will in all cases reveal all significant (material) misstatements in the financial statements. Irregularities may arise as a result of fraud or error and are considered material if it can be reasonably assumed that, individually or collectively, they would influence the economic decisions made by users on the basis of the financial statements.

We are obliged to inform the Managing Director, *inter alia*, of the planned scope and timing of the audit and of any significant findings made during the audit, including any major deficiencies identified in the internal control system.

22HLAV s.r.o.

Member of the international association of independent professional companies

MSI Global Alliance, Legal & Accounting Firms

Všebořická 82/2, 400 01, Ústí nad Labem

Czech Chamber of Auditors authorisation no. 277

Ing. Jan Černý

Czech Chamber of Auditors authorisation no. 2455

Prague, 16 April 2021

Annex D: List of abbreviations

AS CR	Czech academy of Sciences
BEACON	Bentonite Mechanical Evolution project, part of the EC H2020 programme, https://www.beacon-h2020.eu/
BIOPROTA	Research project on the migration of radionuclides into the biosphere, https://www.bioprota.org/
CIM	Research project on carbon and iodine migration in cement (GTS), https://www.grimsel.com/gts-phase-vi/
DECOVALEX	Development of Coupled models and their Validation against Experiments research project on modelling, https://decovalex.org/
EBS	Engineered barrier system
EC	European Commission
EDU	Dukovany nuclear power plant
ETE	Temelín nuclear power plant
EU	European Union
EURAD	Research project, programme EC H2020, https://www.ejp-eurad.eu/about-eurad
GTS	Grimsel Test Site, underground laboratory, Switzerland, https://www.grimsel.com/
HotBent	High temperature effects on bentonite buffers research project, https://www.grimsel.com/gts-phase-vi/
DGR	Deep geological repository for HLW and SNF
ICT	Information and communication technology
IGD-TP	Implementing Geological Disposal of radioactive waste Technology Platform, https://igdtp.eu/
ISA	International Standards on Auditing
LTD	Long Term Diffusion research project, https://www.grimsel.com/gts-phase-vi/ltd/ltd-introduction
IAEA	International Atomic Energy Agency, https://www.iaea.org/

MaCoTe	Material Corrosion Test research project, https://www.grimsel.com/gts-phase-vi/macote-the-material-corrosion-test/macote-introduction
Mock-up Josef	Research project, https://ceg.fsv.cvut.cz/vyzkum/projekty/2011-2015-mock-up-josef
OECD/NEA	Atomic Energy Agency of the Organisation for Economic Cooperation and Development, https://www.oecd-nea.org/
WDP	Waste disposal package
URF	Underground research facility
RAW	Radioactive waste
SKB	Swedish company for the management of nuclear waste
SÚRAO	Czech Radioactive Waste Repository Authority
SÚJB	State Office for Nuclear Safety
TDB	Thermochemical Database research project, https://www.oecd-nea.org/dbtdb/
HLW	High-level waste
R&D	Research and development
REP	Research and experimental plan
SNF	Spent nuclear fuel
WMO	Waste management organisation

SÚRAO | RADIOACTIVE WASTE REPOSITORY AUTHORITY

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