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Annual Report 2007

Radioactive Waste
Repository Authority

SÚRAO

The Radioactive Waste Repository Authority (RAWRA) is a state organisation established under the provisions of Article 26 of Act No. 18/1997 Coll., on the peaceful uses of nuclear energy and ionising radiation (the Atomic Act) and on amendments to certain other Acts. RAWRA'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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Mr. Vítězslav Duda
Managing Director

MANAGING DIRECTOR'S INTRODUCTION

During 2007, as in previous years, the Radioactive Waste Repository Authority (RAWRA) provided for the safe management of radioactive waste in the Czech Republic, thus successfully fulfilling its statutory obligations and respecting its in-house regulations. The operation of the Dukovany, Richard and Bratrství repositories for the disposal of low-level and intermediate-level radioactive waste was undertaken in compliance with the relevant legislation and licences granted by the State Office for Nuclear Safety (SÚJB).

The sealing of an emplacement chamber at the Richard repository was completed following the preparatory stage of the project which was co-financed by the EU. Historical radioactive waste disposed of at the Richard repository was transferred to newly prepared chambers following the thorough checking and subsequent treatment of the waste. A refurbished laboratory to be used for the testing of waste transport packages and containers was put into operation.

Nuclear safety, radiation protection, physical protection, emergency preparedness and the maintenance of buildings, machinery and equipment were fully provided for throughout the year at all operational repositories.

RAWRA continued during 2007 to push ahead with the deep geological repository programme concerning the disposal of high-level radioactive waste and spent nuclear fuel. Research projects were carried out as part of the programme to study in detail the long-term behaviour of the overall disposal system. A number of these projects were undertaken in cooperation with foreign organisations and institutions. RAWRA's communications activities continued in those regions where candidate repository sites are located, however, local people continue to be overwhelmingly against the project. Their main concerns include increased radioactivity levels, the adverse impact of underground tunnelling on the environment and landscape, and a drop in land prices. Several excursions for people from local communities to selected nuclear facilities were organised during the year as part of RAWRA's ongoing communications programme. Geological research at potentially suitable locations has been suspended.

RAWRA's administrative obligations during the year included the supervision of Nuclear Account funds paid by radioactive waste generators, the verification of estimates of the costs involved in nuclear facility decommissioning, inventory maintenance and reporting etc. RAWRA continued to keep the public up to date on its activities through its information centres, via the internet, through press releases and through various publications released during the year.

In 2007 RAWRA celebrated the 10th anniversary of its establishment. Following a preparatory period from 1997 to 1999, during which RAWRA assumed the management of the deep geological repository programme and obtained the required licences for the operation of all Czech repositories from the SÚJB, the repositories

10 years

currently in operation were transferred on 1 January 2000 into State ownership since which time these repositories have been managed exclusively by RAWRA. During the period 2000 to the end of 2007 more than 3,000 tonnes of conditioned radioactive waste were disposed of by RAWRA.

During the past decade, RAWRA has continued the development of a deep geological repository in which high-level radioactive waste will be disposed of. The timetable for the repository development programme was refined in order to comply with the Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic approved by the Government in May 2002. The commissioning of a deep geological repository is planned for 2065 while a suitable site should be identified by 2025. As part of the site selection process, RAWRA completed in April 2003 an assessment of the whole of the Czech Republic according to clearly defined criteria. The assessment, based on available archive data, was aimed at selecting those sites which meet the set requirements for the construction of a deep geological repository and which are not in conflict with any currently verifiable criteria which exclude the possibility of constructing and operating such a repository. As the result of a comprehensive evaluation, six sites were chosen as suitable. Basic geophysical measurements were taken at the six sites during 2003 aimed at reducing the area to be subjected to subsequent detailed geological research. However, in view of the overwhelmingly negative public attitude to the project, RAWRA has suspended all geological work at the sites until 2009. All six sites have been included in the Land-Use Development Plan for the Czech Republic approved in 2006.

RAWRA, in compliance with the Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic, is responsible for the coordination of the research and development of new technologies which might enable spent nuclear fuel to be reused in new types of nuclear reactors or which might reduce the content of long-lived radionuclides. These technologies are expected to be available for commercial use after 2030.

In conclusion therefore, RAWRA successfully fulfilled its mission as defined in the Atomic Act and maintained the required high standards in addressing its various obligations. It is my pleasure once again to express my thanks to all RAWRA's employees as well as to our various partner organisations for their contributions towards our achieving such highly satisfactory results.

Vítězslav Duda

CURRENT SITUATION IN RADIOACTIVE WASTE MANAGEMENT

Short-lived low-level and intermediate-level waste (LLW/ILW) makes up the largest category of radioactive waste in terms of volume. This type of waste, liquid or solid, is generated during the operation and decommissioning of nuclear reactors and when dealing with ionising radiation sources. The radioactivity content of this waste gradually decreases over a few hundreds of years and, subsequently, this waste can be disposed of in near-surface repositories. The technology for the processing and conditioning of radioactive waste prior to its disposal is well-established internationally and has been adopted in the Czech Republic.

Short-lived LLW/ILW generated at nuclear plants is disposed of in a surface disposal facility located at the Dukovany NPP site. The facility's total disposal capacity of 55,000 m^3 (about 180,000 drums of 200 litres each) is able to accommodate all the waste that it is estimated will be generated at the Dukovany and Temelín NPPs provided that the waste meets acceptance criteria, as well as all the short-lived LLW/ILW to be disposed of following the decommissioning of both NPPs. In addition, this disposal facility can be partly used for the disposal of institutional waste.

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

The Bratrství repository is designed solely for the disposal of waste containing naturally occurring radionuclides. It was constructed in a mined cavity of a former uranium mine and contains 5 chambers with an overall capacity of approximately 1,200 m^3. The facility was put into operation in 1974.

The operation of all Czech repositories, including the monitoring of the now-closed Hostim repository, is undertaken by RAWRA in compliance with relevant licences granted by the State Office for Nuclear Safety (SÚJB) and, in the case of mined cavities, in compliance with permits and licences issued in accordance with mining legislation. The overall capacity of Czech repositories provides enough space for waste disposal for the next several decades.

In addition to short-lived LLW/ILW, a certain amount of long-lived LLW/ILW is also generated; however, this waste cannot be disposed of in existing near-surface facilities. For this type of waste there are special requirements concerning the method and quality of conditioning necessary for its storage and eventual disposal in a deep geological repository (DGR). This waste is currently stored either by waste producers or by RAWRA.

High-level waste (HLW) and spent nuclear fuel (SF) classed as waste are also unsuitable for disposal in existing repositories. It is envisaged that the deep geological repository will also be used for the final disposal of these types of waste. Until such time as the deep geological repository comes into operation, SF will be stored by its producers. With advances in technology, however, it cannot be ruled out that SF producers will decide to make further use of such spent fuel in the future.

The largest and the most modern repository in the Czech Republic is situated at the Dukovany nuclear power plant site. Drums containing nuclear waste from the Dukovany and Temelín NPPs are disposed of at this repository.

The size of each vault is 5.3 by 5.4 by 17.3 metres.
1,600 individual 200-litre drums can be emplaced in the vault if its storage space is exploited to the optimal level.

The repository consists of 112 reinforced concrete vaults arranged in four rows of 28 vaults each. The waste drums are placed within the vaults by a gantry crane; the operator's cabin is shielded to protect the operator from radiation exposure.

Safet

The safe management of radioactive waste and spent nuclear fuel is our main priority as well as an obligation set out by the Act on the Peaceful Uses of Nuclear Energy and Ionising Radiation. We use methods aimed at providing maximum protection for the public, our staff and the environment from radiation exposure and for the release of radioactive substances into the surrounding environment.

Mr. Jiří Faltejsek
Deputy Director and Head of the
Repository Operation Department

OPERATION OF LOW-LEVEL WASTE REPOSITORIES

The Dukovany, Richard and Bratrství repositories were operated in 2007 in compliance with the relevant legal regulations and licences granted by the SÚJB. Radiation monitoring was carried out regularly in accordance with the relevant monitoring programmes. No adverse impact on the environment was detected.

Operation of the Dukovany Repository

With regard to the day-to-day running of the Dukovany repository, RAWRA has entered into a contract with ČEZ, the Czech power company (in accordance with the Atomic Act, Article 26). Nevertheless, the acceptance of waste to be disposed of at this repository and certain other responsibilities, such as inspection, are carried out exclusively by RAWRA.

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

Vault D17 reached capacity level during the year and was sealed whilst the filling of vault D14 commenced in October.

Monitoring of the repository and the surrounding areas was performed in accordance with the approved monitoring programme; no excess radiation or breach of the rules for the safe operation of the Dukovany repository were detected. Three inspections were conducted by the SÚJB at the Dukovany repository during 2007; no serious breaches were discovered during these inspections.

Operation of the Richard and Bratrství Repositories

Both the Richard and Bratrství repositories were operated by RAWRA during 2007 in compliance with the relevant licences issued by the SÚJB and the Czech Mining Authority (ČBÚ). Normal operation of these repositories covered the inspection of the mined cavities, the maintenance of buildings and equipment, machinery, electrical fittings and land. RAWRA was also responsible, in accordance with the relevant licences issued by the SÚJB, for the physical protection, radiation protection, emergency preparedness and nuclear safety of these repositories. Historical radioactive waste was conditioned and subsequently transferred to new emplacement chambers in the underground facility of the Richard repository. As regards the surface area of this repository, both the operations building and the test laboratory for the testing of transport packages and containers were refurbished. The geotechnical and hydrogeological parameters of the Richard and Bratrství repositories were regularly monitored 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.

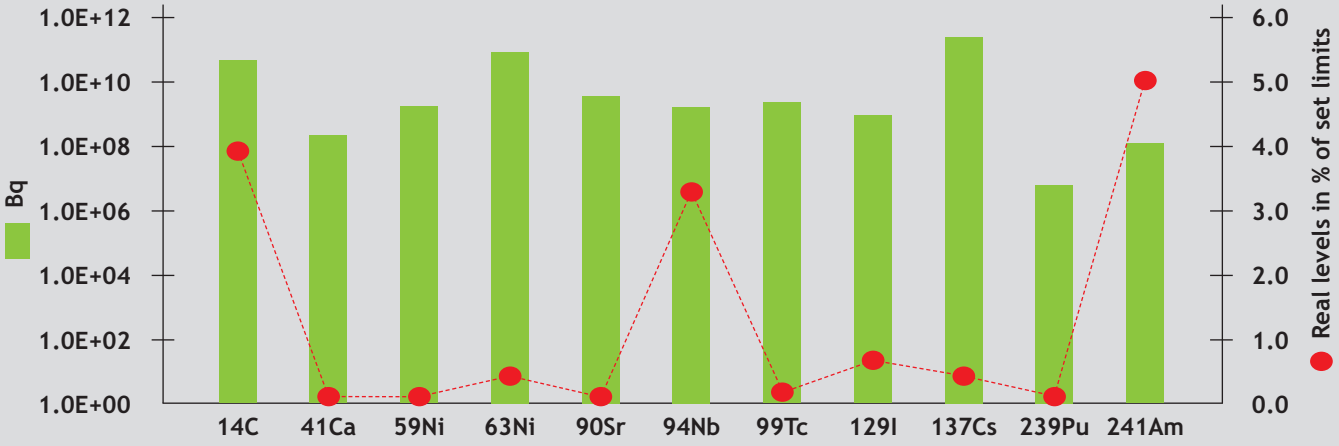
The test laboratory at the Richard repository is used to test containers designed for the transport, storage and disposal of nuclear material and radioactive emitters (with a mass of up to 3,200 kg) as well as to test radioactive substances of special form. Two B(U) type transport packages were tested and the validity of 6 certificates for various types of packages was extended

at the laboratory during the year. The laboratory also provided consulting services to container users throughout the year. The laboratory's total income for 2007 amounted to CZK 351,000.

The Richard repository is currently being used for the temporary management of certain radioactive waste (according to an SÚJB Decision issued in compliance with the Atomic Act, Articles 26 and 31). In 2007 two Decisions were issued by the SÚJB obliging RAWRA to provide for the safe management and subsequent disposal of such sources and waste.

Waste disposed of during 2007	Dukovany repository	Richard repository	Bratrství repository
Number of waste packages (200-litre drums)	1,646	318	57
Total mass of waste packages and lump waste	327.2 t	118.9 t	18.9 t
Total volume of waste	339.05 m^3	63.6 m^3	11.4 m^3
Total activity level (at 31 December 2007)	1,135 GBq	830.4 GBq	82.37 GBq
Activity of alpha emitters		2.06 GBq	

Radioactivity limits for the Dukovany repository and real radioactivity levels



Mr. Zdeněk Laštovička
Quality Manager

Quality Assurance and Control

Over the past few years RAWRA has been developing and constantly updating a quality assurance system the aim of which is to ensure the highest standards of performance. This system is consistent with the requirements of relevant legislation (the Atomic Act and SÚJB Regulation 214/1997, on quality assurance concerning activities related to the use of nuclear energy and radiation exposure). Quality assurance in 2007 focused both on the optimisation of basic in-house regulations with the aim of incorporating these regulations into the quality assurance system so as to be consistent with relevant ISO standards and on internal audits conducted according to a yearly plan approved by RAWRA's managing director.

The development of project PJ.P.03, the "ZOS Litoměřice Quality Assurance Handbook", an in-house collection of regulations for the laboratory at the Richard repository, is a good example of RAWRA's drive to enhance its quality assurance programme; this laboratory, designed for the testing of transport containers and radioactive substances of special form was refurbished in 2006 with Phare support. The quality assurance system at the laboratory was subsequently inspected, the positive results of which were acclaimed by both the Czech Accreditation Institute (which carried out a so-called pre-audit prior to the accreditation process proper) and the SÚJB (as part of the administrative process for declaring the laboratory eligible in terms of Article 23 of the Atomic Act).

Maintaining an Inventory of Accepted Radioactive Waste and Nuclear Material

RAWRA is responsible (according to the Atomic Act, Article 26, paragraph 3d) for maintaining an inventory of accepted radioactive waste and its producers. Detailed rules for maintaining such an inventory are set out in Regulation 307/2002. Records of accepted radioactive waste are maintained both in paper and electronic form. ZISS, the electronic database, contains records of all the radioactive waste accepted by RAWRA. The development of new application software "A Scheme for Monitoring and Maintaining an Inventory of Radioactive Waste" continued during the year. The new software will be based on the results of a Phare project completed in 2006 and is eventually to replace the existing ZISS. Data contained in historical accompanying documentation in paper form relating to waste accepted prior to the transfer of repositories to RAWRA, i.e. before 2000, continued to be gradually incorporated into the digital archive.

Data on 325 licence holders, 134 of them waste producers, had been recorded in the RAWRA system by the end of 2007.

Verification of cost estimates for the decommissioning of nuclear installations and facilities with ionising radiation sources

RAWRA is responsible for such verification under the provisions of the Atomic Act. 21 holders of licences for operating facilities with significant and very significant radiation sources applied for the verification of decommissioning cost estimates during 2007.

Entrance portal of the Richard repository.

The Richard repository was constructed at the site of the abandoned Richard II limestone mine (underground, beneath the Bídnice hill). Since 1964, institutional waste has been disposed of at this repository. The total volume of this underground facility exceeds 17,000 m^3; the disposal capacity makes up approximately half that volume, the remainder being service corridors.

Crane used for transport package drop tests.

Emplacement chamber at the Richard repository.

Ms. Soňa Konopásková
Head of the Safety and Licensing Department

SAFETY AND RADIATION PROTECTION

RAWRA manages its repositories and relevant support activities in compliance with licences issued by the SÚJB and as required by the Atomic Act. Further relevant documentation required for RAWRA to operate its repositories has been approved (the licence for the Dukovany repository has been extended to 15 December 2012 and for the Richard and Bratrství repositories to 31 October 2008 and 31 December 2008, respectively).

In 2007 RAWRA obtained a licence for radioactive waste management applicable for the overall operation of and disposal of radioactive waste at the Dukovany repository. In order to obtain the licence, the safety report on this repository was updated as were those documents which are subject to approval including Limits and Operating Conditions together with Acceptance Criteria for the Dukovany repository.

The conditioning of historical radioactive waste at the Richard repository using the “hydraulic cage concept” was completed in 2007 in compliance with the relevant permission obtained in 2006. Permission for the reconstruction of chambers No. 13 and No. 22 was obtained in early 2007 and the reconstruction completed by the end of the year.

During the year, the laboratory at the Richard repository was declared, by SÚJB Decision, to be eligible for testing transport containers and radioactive substances of special form; the laboratory is authorised to test containers for the transport, storage or disposal of nuclear material, radioactive substances and radioactive substances of special form, as well as to issue certificates proving that the products tested comply with the requirements of SÚJB Regulation 317/2002.

The Bratrství repository was operated in accordance with an SÚJB licence effective up to 31 December 2008. Based on a technical design proposal and feasibility studies performed in 2004 and 2005, the Operating Conditions for the Bratrství repository were modified during 2007 by an SÚJB Decision concerning the refurbishment of chamber No. 2. The chamber is to be refurbished by 31 December 2012; self-compacting concrete and compaction grouting using a clay-cement mixture will be employed in the refurbishment.

In order to meet all requirements concerning radiation protection (as defined by Regulation 307/2002), the monitoring of repositories currently in operation as well as the now-closed Hostim repository is carried out. All staff potentially exposed to radiation are equipped with personal dosimeters and receive full medical check-ups on a regular basis. The expertise and skills of A and B category workers are regularly verified and the inventory of RAWRA owned radiation sources regularly updated. No radiation protection breach occurred during the year.

Concerning statutory requirements for radiation protection, RAWRA co-operated closely with the SÚJB during their facility inspections and supervised the subsequent correction of any deficiencies identified. Requirements defined in SÚJB Regulation 318/2002, on emergency preparedness, were satisfied.

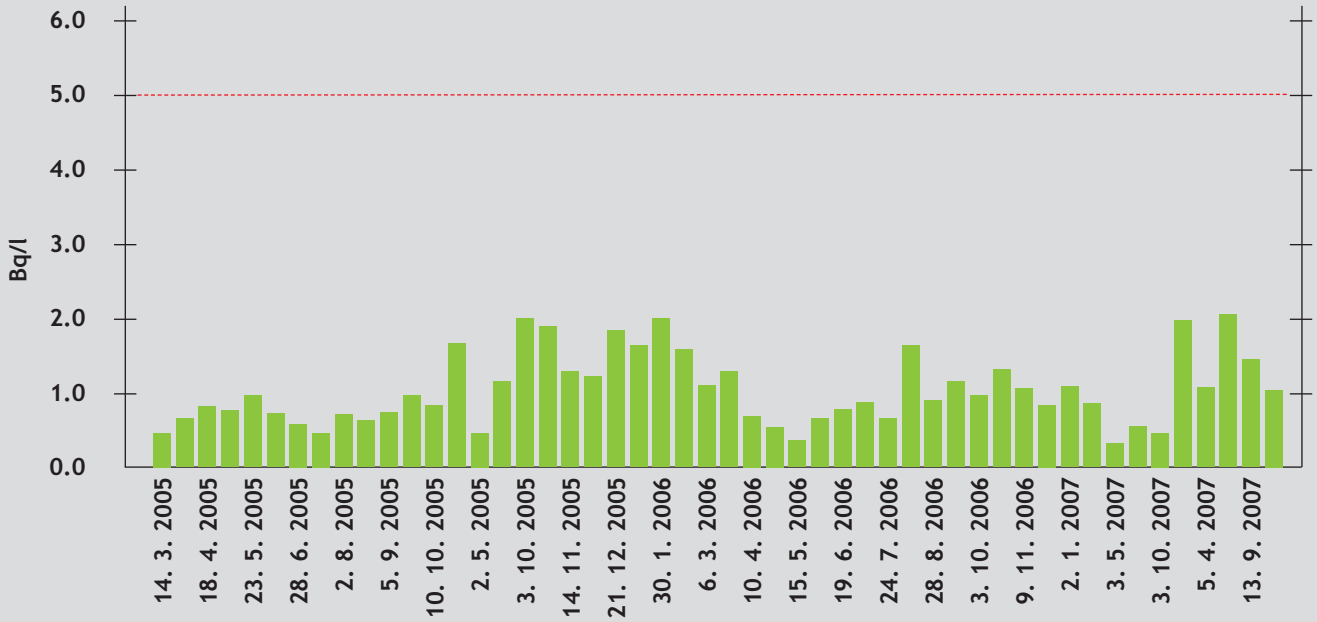
Mining Safety and Occupational Safety

The mines manager is responsible for implementing mining rules and regulations and verifying adherence to such rules and regulations namely Act 61/1988, on mining operations, explosives and state mining administration,

ČBÚ Regulations 22/1989, on mining safety and health and 99/1992, on the installation, operation and dismantling of facilities for underground waste disposal, as well as regulations relating to health and safety at work.

Special training courses were organised for both RAWRA and outside contractor employees working in the underground facilities of the Richard and Bratrství repositories; day-to-day contacts with Regional Mining Authorities in Most and Příbram were maintained. Risk assessment and fire protection exercises were carried out in conjunction with the Main Mining Emergency Station in Most. In compliance with the provisions of the Labour Code, all of RAWRA's staff underwent training to improve their skills in the field of health and safety at work and fire protection.

Richard repository - Retention reservoir - Total volume beta activity



We employ the most advanced technologies available for radioactive waste management. Special laboratory and dosimetry equipment is used to determine with great accuracy the composition of the radionuclides contained in any material. Advanced methods are also employed for radioactive waste processing and treatment as well as the operation of repositories. Thanks to longstanding international cooperation, we first acquire and then prepare for practical application the latest expertise concerning the geological disposal of high-level radioactive waste.

blogy

Mr. Miroslav Kučerka
Head of the Technical Support Department

TECHNICAL SUPPORT

In addition to the routine operation of Czech repositories, RAWRA is responsible for the development of various associated investment and technological projects. Projects for the sealing of individual chambers at the Richard repository, for refurbishing the operations building and the testing facility for the testing of transport packages and containers, and for the development of software for monitoring and maintaining an inventory of radioactive waste were among the most important projects underway during 2007.

Phare and Transition Facility Programmes in 2007

RAWRA was active during the year in coordinating the following 3 projects related to the various uses of nuclear energy conducted under the EU Phare and Transition Facility programmes organised by the EC Directorate General for Enlargement:

The "Realisation of Closure of Chambers in the Richard Repository" project (CZ 632.02.04); commenced on 28 November 2005 and completed on 30 September 2007, was based on the results of Phare project 01.14.03 entitled "Solution for Closure of a Chamber in the Richard Repository" which was completed in August 2005. The aim of the project was to refurbish chambers 8/2, 9 and 12 at the Richard repository, relocation of historical radioactive waste disposed of at the repository from 1965 to 1985 to the refurbished chambers followed by the final emplacement of the waste, sealed in concrete backfill. A total of 14,988 packages of historical waste were transferred, mostly from chamber No.22, to the refurbished chambers and subsequently backfieled.
A total of EUR 970,292 was provided from EU funds for the project.

The aim of the "Refurbishment of the Hot Cell at the Richard Repository" project (CZ 0403.01), commenced on 2 May 2006 and completed on 2 May 2007, was to refurbish and then return the original hot cell in the operations building at the Richard repository to full operation. The project consisted primarily of the supply of new manipulators and the upgrade of existing equipment. Equipment installation was completed and comprehensive testing performed in the first half of 2007 and the chamber was commissioned on 2 May 2007.
A total of EUR 298,910 was provided from EU funds for the project.

The technical specification for the "Upgrade of the RAWRA Integrated Management and Information System to Ensure Repository Safety" (CZ 182.06.01) project, to commence in 2008, was prepared by RAWRA during the year. Tender documentation was subsequently prepared followed by the launch of the contractor tendering procedure. A total of EUR 400,000 is expected to be provided from EU funds.

Physical Protection and Inventory of Accepted Nuclear Material

A project for the upgrading of the physical protection system at the Richard repository from category III to category II reached fruition during the year and RAWRA subsequently obtained an SÚJB licence for the management of category II nuclear material. An inventory of nuclear material was maintained in compliance with Regulation 316/2002. A total of 97 items of nuclear material had been recorded by 31 December 2007.

The "Realisation of Closure of Chambers at the Richard Repository" project; a closed chamber.

The "Refurbishment of the Hot Cell at the Richard Repository" project.

The "Realisation of Closure of Chambers at the Richard Repository" project; the construction of the inner wall of the hydraulic cage.

Mr. František Woller
Head of the Geological Repository
Development Department

DEVELOPMENT OF A DEEP GEOLOGICAL REPOSITORY

The Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic stipulates that spent nuclear fuel classed as waste as well as high-level radioactive waste, including waste generated during spent nuclear fuel reprocessing, be finally disposed of in a deep geological repository. The construction of such a repository in the Czech Republic is envisaged as the basic option for the disposal of these types of waste. The Concept also stipulates that research concerned with the development of new technologies for spent nuclear fuel reprocessing and transmutation be supported and coordinated. The Concept provides a long-term framework for RAWRA's activities with respect to deep geological repository development and spent nuclear fuel disposal. RAWRA continued to follow these guidelines throughout 2007.

RAWRA's concept for the final stage of the fuel cycle, including a option for disposal in a suitable geological environment, i.e. a deep geological repository, is based on the following three pillars:

- Safety of the concept as a whole and safety demonstrability;
- Technical and economic feasibility;
- Acceptability on the part of the public.

The safety of the repository will be ensured by 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. Technical and economic feasibility can be attained by employing a combination of the best technologies, structures and materials available which are suitable for use in an underground rock mass; cost considerations with regard to such a project clearly must not endanger safety. Public acceptance, the third pillar of the concept, requires that RAWRA continues to search for new methods of communication with the public in order to explain as clearly as possible the aim of the project and its potential impacts and risks. Any new methods employed should be transparent and gain the full trust of the public. Presentations, outlining the objectives and various design options envisaged should be organised, as should informal meetings and discussion forums with local people in the areas concerned.

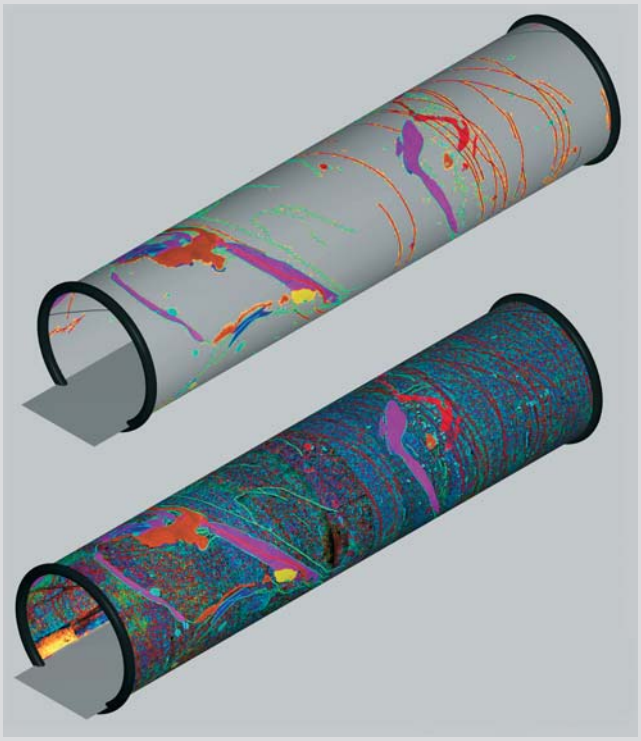
DGR Design, Research into Near- and Far-Field Processes, and Safety Assessment

The potential design of both the underground structures and the surface area of a deep geological repository is an important part of the deep geological repository programme. A Reference Design for a deep geological repository to be constructed at a hypothetical site was completed in 1999; certain parts of the design have been updated to various extents. Ongoing research and development in this field continues to provide large amounts of both new and refined information. In 2007 RAWRA commenced the complete updating of the Reference Design by preparing the respective invitation for public tender.

Following the completion of the MOCK-UP long-term experiment at the Centre for Experimental Geotechnics at the Czech Technical University in Prague, research into engineered barriers focused on a comprehensive evaluation of the behaviour of bentonite of Czech origin when exposed to long-term thermal load.

Assessment of the impact of tunnelling on granitoid rock based on the study of physical conditions in the surroundings of open quarries – work in the Ruprechtice quarry, northern Bohemia.

Launch of an experiment carried out as part of the Euroatom TIMODAZ project at a laboratory at the Centre for Experimental Geotechnics of the Czech Technical University in Prague. The aim of the experiment is to study the impact of long-term thermal load on tunnel lining stability.



3D geological models of the Bedřichov water supply tunnel in the Jizerské Mountains. The study aimed to develop methodology for geological mapping using electronic laser scanning of the tunnel walls.

Ms. Věra Šumberová
Research Project Manager

The results obtained will significantly contribute towards understanding processes occurring within what is considered to be potentially the most suitable material for use in the engineered barrier of a future deep geological repository and provide an important source of data and knowledge for the compilation of a comprehensive study of near-field processes.

The research into near-field processes in a deep geological repository, which began in 2005, is nearing completion. The aim of the research is to establish the scientific and technological basis for an assessment of near-field safety. The work is being carried out, on a contractual basis, by the BP-Bariéry consortium (consisting of the Nuclear Research Institute at Řež, the Technical University of Liberec, the ARTEC Centrum, the Centre for Experimental Geotechnics at the Czech Technical University in Prague, the Nuclear Chemistry Department of the Czech Technical University in Prague, and the Department of Analytical Chemistry of the Institute of Chemical Technology in Prague). The research focuses on testing the methodology employed for studying the degradation of spent nuclear fuel, the corrosion of disposal packages and the degradation of bentonite; the uncertainties of determining adsorption and diffusion coefficients of radionuclides in bentonite are assessed. As regards the modelling of processes occurring in such a repository, research focuses on introducing computing models facilitating calculations of heat distribution in the repository after the emplacement of disposal packages containing spent nuclear fuel and the impact of temperature on the excavation-disturbed zone.

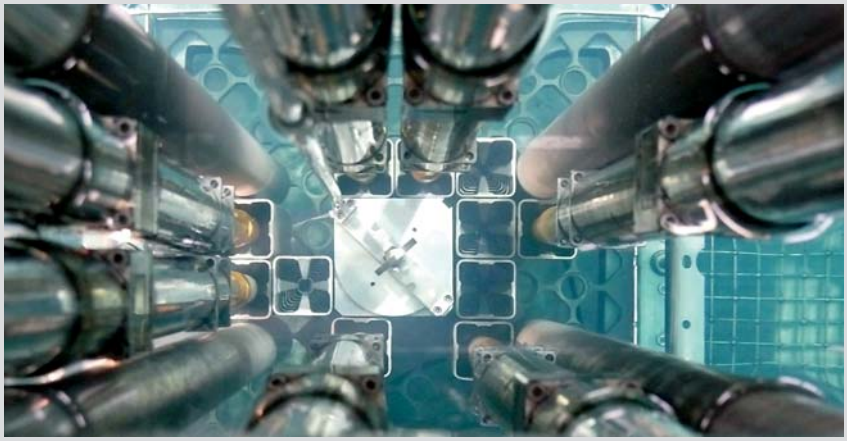
Supporting Research Projects

The Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic requires that in addition to the development of a deep geological repository, the progress of separation (partitioning) and transmutation technologies be monitored and supported. Such technologies could bring about a significant reduction in the amount and, perhaps more importantly, the radiotoxicity of waste disposed of in a deep geological repository. With the support of ever more efficient technologies, requirements placed on a future deep geological repository might be eased which in turn could lead to a reduction in the time required for the waste disposed of in the repository to be isolated from the environment, to a reduction in the size of the underground part of the repository or to an increase in disposal capacity due to lower heat development. Consequently RAWRA, in line with the Government's concept, wholeheartedly supports research in this field.

As regards separation, a four-year project was completed in 2007 concerning the pyrochemical reprocessing of spent nuclear fuel, specifically the fraction distillation of fluorides and electrochemical separation methods. Electrochemical methods are particularly relevant to the on-line reprocessing of molten fluoride salt-based fuel for transmutation reactors (molten salt reactors). Additional follow-up and parallel projects were aimed at finding appropriate extraction agents for the extraction of lanthanoids and, primarily, minor actinides from aqueous solutions in the Purex reprocessing application which is currently in commercial use in France and Great Britain.

Experimental line for the fraction distillation of fluorides (Nuclear Research Institute, Řež). This method allows certain components of spent nuclear fuel to be separated.

Preparation for the measurement of the neutron field in a model of part of the transmutor under development with fluoride salt-based fuel. The target chamber of the neutron source can be seen on the right-hand side of the photograph.



Preparation of the active zone for a basic critical experiment to be carried out in the “Vrabec” educational reactor at the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague. The active zone comprises a module containing fluoride salts.

Communi

We provide regular information on our activities and objectives concerning the safe disposal of radioactive waste. The public has the right to know the risks relating to the operation of nuclear installations and their impact on the environment. Comprehensive environmental impact assessments of nuclear installations could provide the basis for well-balanced and transparent communication with the public. We are committed to effective dialogue with local residents and local authorities in those areas affected by our current and future operations.

cation

Ms. Lucie Steinerová
Head of the Communication Department

COMMUNICATION

The free availability of information on radioactive waste management is a necessary precondition for a full discussion involving all the parties interested in finding the best way to tackle the issue of high-level radioactive waste and spent nuclear fuel in the Czech Republic in the future. RAWRA has traditionally aimed to enhance the public's awareness of radioactive waste and its management in the Czech Republic. The internet and RAWRA's information centres are the main channels of communication employed to provide the relevant information. The Prague information centre provides both individuals and groups of visitors with multimedia and computer presentations, display posters, models, film clips and printed materials throughout the year. RAWRA's specialists are ready at any time to answer questions relating to radioactive waste, its generation and management. Over 600 young people from both secondary schools and universities in Prague and other areas of the country visited RAWRA's information centre in Dlážděná Street, Prague during 2007.

RAWRA is keen to maintain good relations with stakeholders particularly with the local populations of those areas in which operating repositories are situated as well as areas potentially eligible for the construction of a deep geological repository.

Following the establishment of a RAWRA information centre at Rouchovany, which was well received by the local community, similar information centres were set up at a further two villages – Lubenec and Rohozná. Display posters, RAWRA's website and those of other domestic and foreign organisations responsible for radioactive waste management as well as various relevant film clips are available to visitors. RAWRA information posters are also on display and printed materials available at specially altered premises on the ground floor of the community council building at Dolní Cerekev. Meetings between RAWRA specialists and 48 representatives of all the six local communities involved were organised at the end of the year to discuss, on site, issues relating to the potential construction of a deep geological repository.

Opinion polls were conducted in the spring of 2007 in the six localities involved; the results will serve as a key indication of the direction which should be taken with regard to future communication activities relating to the deep geological repository project. A further excursion to Sweden was organised in 2007 for representatives of local communities in which candidate repository sites are located. Participants visited the Äspö underground laboratory, met representatives of a local civic association and were provided with the opportunity to become familiar with the modern technologies employed at a deep geological repository. RAWRA also provided excursions to domestic facilities, namely the Richard and Dukovany low-level and intermediate-level waste repositories; a number of foreign specialists visited these facilities during the year.

International Cooperation

The issue of radioactive waste management has to be satisfactorily addressed in each and every country employing ionising radiation sources. Broad international cooperation has been established to deal with this demanding and complex issue. International institutions generally co-ordinate radioactive waste management activities, put forward legal and regulative initiatives and form a platform for meetings of specialists and the

A conference was organised as part of the ESDRED (Engineering Studies and Demonstration of Repository Designs) project, part of the 6th Framework Programme for Research and Technological Development. The conference was held at the Faculty of Civil Engineering of the Czech Technical University in Prague with the participation of Czech students.

Provision of Information according to Act 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	0
Other information concerning the implementation of Act 106/1999	-

exchange of information. The most important aspects of international cooperation as far as RAWRA is concerned include the testing of methods for the assessment of repository safety, the demonstration of the feasibility of deep geological repositories and the development of new technologies. Since the Czech Republic is a signatory to the IAEA Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, RAWRA together with the SÚJB share the responsibility for meeting the requirements defined in this Convention.

Radioactive waste management issues are also handled by the OECD/NEA, specifically its Radioactive Waste Management Committee (RWMC). The RWMC is organised in the form of internal and external working groups. RAWRA specialists represent the Czech Republic on the RWMC as well as in the Integration Group for Safety Case (IGSC) and the Forum on Stakeholder Confidence working groups. RAWRA organises and in some cases finances the participation of Czech representatives in specific projects. RAWRA is also involved in the activities of the European Commission (EC) relating to radioactive waste management.

Concerning bilateral cooperation, RAWRA is keen to establish direct links with foreign organisations similarly involved in radioactive waste management to the mutual advantage of both parties. Framework cooperation agreements have been signed between RAWRA and NAGRA (Switzerland) and POSIVA (Finland) amongst others and RAWRA has been involved in specific joint projects with SKB (Sweden).

Ms. Jaroslava Liehneová
Personnel and Internal Audit Manager

MANAGERIAL, TECHNICAL, LEGAL AND ADMINISTRATIVE ISSUES

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

Internal Control System

RAWRA's internal control system was adopted in compliance with Act 320/2001, on financial control in the public sector. The system is designed to reflect the Authority's specific conditions, principally its organisational structure, the number of staff employed and the combination of responsibilities where relevant.

RAWRA's internal control system is defined in the following basic management directives: the Handbook on RAWRA's Control System; the Standing Orders; the Internal Auditing System; and Principles of Asset Management. These documents specify the responsibilities of individual departments, the competences and responsibilities of the management and executives, as well as the main audit principles and methods to be adopted by RAWRA's management. Based on these management directives, a number of in-house regulations have been drawn up which set out the rules governing individual activities.

Management control as specified in Articles 26 and 27 of Act 320/2001, i.e. preliminary, continuous and follow-up control, is ensured by responsible managers as part of the internal control system. RAWRA's work is governed by the yearly plan of activities, the budget approved by the Government and the principles of the internal control system.

The Authority's financial management is supervised by RAWRA's Board. Internal audits are performed, as stipulated in Articles 28 and 29 of the Act, by the internal auditor who is directly responsible to the Authority's Managing Director. Internal audits during 2007 were conducted according to a yearly plan approved by RAWRA's Managing Director.

The internal auditor's recommendations were aimed at improving management procedures within the Authority and at strict adherence to internal control system rules.

A report on the results of the various internal audits and the efficiency of the internal auditing system was prepared in accordance with Regulation 416/2004 and submitted to the appropriate department of the Ministry of Finance which is the administrator of the relevant budget chapter.

Auditing Licensees' Decommissioning Reserves

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

Audits were conducted at 13 organisations comprising a total of 30 facilities. Audits aimed at verifying the accumulation of financial reserves were conducted in 2007 under the same rules as in the previous year. Audits were performed in cooperation with the respective licence holders and requests by RAWRA for supplementary documentation were duly met.

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

Staffing and Premises

RAWRA had 38 employees at the year end, including 2 employees on maternity leave. As regards the staff educational profile, more than half the staff (55%) are university-educated employees while the rest (45%) have completed full secondary school education.

RAWRA'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. RAWRA's statutory obligations concerning health and safety at work and fire protection (the Labour Code and the Fire Protection Act) were met by employing a specially qualified person.

RAWRA fulfilled its obligation set out by Act 435/2004 (the Employment Act) concerning the obligatory proportion of handicapped persons employed on the staff.

Contributions were made from the cultural and social needs fund (created pursuant to Regulation 114/2002) towards the cost of meals and supplementary pensions as well as towards the organisation of cultural and sports events; birthday and retirement bonuses for RAWRA employees were also covered from this fund.

We are well aware of our responsibility for the results achieved and for RAWRA's efficient financial management. Our performance is subject to regular quality control. Reports on repository operation and impacts on the environment are submitted both to inspection authorities and the general public.

ibility

Mr. Milan Dvořák
Deputy Director
and Head of the Economics and
Administration

FINANCIAL MANAGEMENT

RAWRA's activities are financed principally from Nuclear Account funds and grants from the state budget (in accordance with the Atomic Act, Article 28, paragraph 1) for the management of that radioactive waste disposed of prior to the Atomic Act coming into force.

RAWRA 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 505/2002. RAWRA's budget is determined according to a budget structure defined by Ministry of Finance Regulation 323/2002.

RAWRA holds no assets of its own, effects no depreciation of fixed assets, creates no reserves, is not a payer of income tax (in terms of Article 18/2c, Act 586/1992), nor of value added tax, and makes no profit. All its revenues from services provided to radioactive waste producers as well as unused budget funding are returned to the Nuclear Account at the year end.

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

RAWRA expenses in 2007 (CZK 000)

	Current expenses	Capital expenses
Dukovany repository	13,771	164
Richard and Bratrství repositories	20,375	7,838
Deep geological repository	2,893	33,680
Managerial and administrative matters	20,777	1,290
Grants to the Rouchovany, Litoměřice and Jáchymov municipalities	4,500	
Total expenses	**62,316**	**42,973**

Administration of Nuclear Account Funds

The administration of Nuclear Account funds was governed in 2007 by the Atomic Act, Article 27, Government Decree 416/2002, on the scale of charges and manner of payment by radioactive waste producers to the Nuclear Account and on annual contributions to local communities, and Act 337/1992, on the administration of taxes and levies, as amended. Detailed records were kept on individual contributors to the Nuclear Account (in compliance with Government Decree 416/2002, Article 3).

Payments by producers of radioactive waste from nuclear reactors

Pursuant to Government Decree 416/2002, Article 1, ČEZ contributed CZK 1,308,602,000 while the yearly contribution made by the Nuclear Research Institute was CZK 400,000. Both amounts were paid in regular monthly instalments which were made directly to the Nuclear Account..

Payments by other producers of radioactive waste

Other waste producers, as specified in Article 2 of Government Decree 416/2002, paid their charges following acceptance of their waste for disposal by RAWRA. Payment notices were issued to each waste producer (based on a contract between RAWRA and the respective waste producer) on acceptance of the radioactive waste accompanied by the relevant waste acceptance documentation. The total sum paid in 2007 amounted to CZK 6,974,000.

Disposable funds in the Nuclear Account were invested by the Ministry of Finance in the financial market (in compliance with the Atomic Act, Article 27). The total gross return on these investments in 2007 was CZK 317 million.

Evaluation of RAWRA's Performance

RAWRA met its responsibilities for the safe and reliable operation of Czech radioactive waste repositories as defined in the Atomic Act during 2007. 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 for external subcontractors, RAWRA complied with the provisions of Act 137/2006, on public works 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.

AUDITORS' REPORT

The accounting records of RAWRA and its financial statements have been subjected to external audit, under the provisions of the Atomic Act, Article 30. The audit was conducted by auditor Mr Vít Dobiáš, certificate No. 1593. The outcome of the audit shows that the keeping of accounting records and the financial statements comply with applicable regulations.

Auditors' report including auditors' opinion

We have audited the financial statements of the Radioactive Waste Repository Authority comprising the balance sheet and the profit and loss account as at 31 December 2007, and an annex to the financial statements.

Management's responsibility for the financial statements

RAWRA's management is responsible for the preparation and fair representation of the financial statements in accordance with Czech accounting regulations. This responsibility includes designing, introducing and implementing in practice a system of internal control relevant to the preparation and fair representation of financial statements that are free from material misstatement, whether due to fraud or error, selecting and employing appropriate accounting methods and making accounting estimates reasonable in the circumstances.

Auditors' responsibility

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

The audit includes audit procedures aimed at obtaining conclusive evidence relevant to the amounts and disclosures given in the financial statements. The audit procedures employed depend on the auditor's judgement, including his assessment of the potential risk that the financial statements might contain considerable irregularities due to fraud or mistake. Risk assessment considers the results of internal audits relevant to the

preparation and presentation of the financial statements. The aim of internal audit assessment is to recommend adequate audit procedures without expressing the auditor's view of the efficiency of internal audit procedures. The audit also includes an assessment of the adequacy of the accounting methods employed and estimates made by the management of the accounting entity, and an evaluation of the overall adequacy of the presentation of information in the financial statements.

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

Auditors' opinion

In our opinion, the financial statements attached herein give a true and fair view of the assets, liabilities and the overall financial situation of the accounting entity as at 31 December 2007 as well as the costs, revenue and profit/loss for 2007 in compliance with the accounting regulations effective in the Czech Republic.

Prague, 11 March 2008

Vít Dobiáš
licence No. 1593

REVENUE AND EXPENSE STATEMENT AS AT 31 DECEMBER 2007 (CZK 000)

I. BUDGET REVENUES

Item No.	Item	Approved budget	Adjusted budget	Factual
000021	Revenues from own activities	0	0	627
000023	Revenues from sales of non-capital assets	0	0	1,763
000031	Revenues from sales of long-term assets	0	0	24
000041	Current grants received	62,500	49,500	49,500
000042	Capital grants received	45,000	45,000	43,000
	TOTAL	**107,500**	**94,500**	**94,914**

II. BUDGET EXPENSES

372450	Wages, salaries and other remuneration	19,211	19,211	19,179
372451	Non-investment acquisitions and related expenses	38,512	38,500	38,355
372453	Non-investment transfers and certain other payments	277	4,786	4,782
372459	Other non-investment expenses	4,500	0	0
37245	Current expenses	62,500	62,497	62,316
372461	Asset acquisitions and related expenses	45,000	45,000	42,973
37246	Capital expenses	45,000	45,000	42,973
	TOTAL	**107,500**	**107,497**	**105,289**

BALANCE SHEET AS AT 31 DECEMBER 2007 (CZK 000)

ASSETS	at 1 Jan. 2007	at 31 Dec. 2007
A. Fixed assets	**540,170**	**590,912**
1. Intangible fixed assets	204,591	241,444
2. Accumulated depreciation – intangible fixed assets	0	0
3. Tangible fixed assets	335,578	349,468
4. Accumulated depreciation – tangible fixed assets	0	0
5. Long-term financial assets	0	0
B. Current assets	**9,029**	**4,895**
1. Stocks	0	0
2. Receivables	1,668	553
3. Financial assets	1,570	1,727
4. Budget management	5,791	2,615
5. Temporary accounts of assets	0	0
TOTAL ASSETS	**549,198**	**595,807**

LIABILITIES		
C. Own financial resources for covering assets	**540,991**	**591,545**
1. Property funds	540,170	590,912
2. Financial funds	98	81
3. Special funds of state organisations	0	0
4. Budget financial sources	0	0
5. Profit and loss account	723	552
D. Liabilities	**8,207**	**4,262**
1. Reserves	0	0
2. Long-term payables	0	0
3. Short-term payables	8,207	4,262
4. Bank accommodations and loans	0	0
5. Temporary accounts of liabilities	0	0
TOTAL LIABILITIES	**549,198**	**595,807**

RAWRA'S BOARD

The activities of the Radioactive Waste Repository Authority are supervised by RAWRA's Board. The membership of the Board comprises representatives of the Ministry of Industry and Trade, the Ministry of Finance, the Ministry of the Environment, major radioactive waste producers, the regions in which those municipalities with radioactive waste repositories are located, as well as representatives of the public. Through its various decisions and recommendations, the Board takes an active part in RAWRA's activities during the year.

In 2007 RAWRA's Board consisted of the following members:

Mr. Luděk Janík
Chairman of the Board
Ministry of Industry and Trade

Representatives of the State:

Mr. Martin Holý
Geology Section at the Ministry of the Environment

Mr. Luděk Janoušek
(to the 52nd meeting of the Board)
Economist at the Ministry of Finance

Ms. Zdeňka Vojtíšková
(from the 53rd meeting of the Board)
Economist at the Ministry of Finance

Representatives of the general public:

Mr. Vladimír Černý
(to the 52nd meeting of the Board)
Chairman of the Rouchovany local council
represented communities in the regions with existing radioactive waste repositories

Mr. Miloš Kudera
(from the 53rd meeting of the Board)
Chairman of the Dukovany local council
represents communities in the regions with existing radioactive waste repositories

Mr. Pavel Gryndler
Environment Department of the Litoměřice town council
represents communities in the regions with existing radioactive waste repositories

Mr. Bronislav Grulich
Vice-Chairman of the Jáchymov town council
represents communities in the regions with existing radioactive waste repositories

Mr. Jan Horník
Senator
represents the general public and the regions with planned radioactive waste repositories

Representatives of radioactive waste producers:

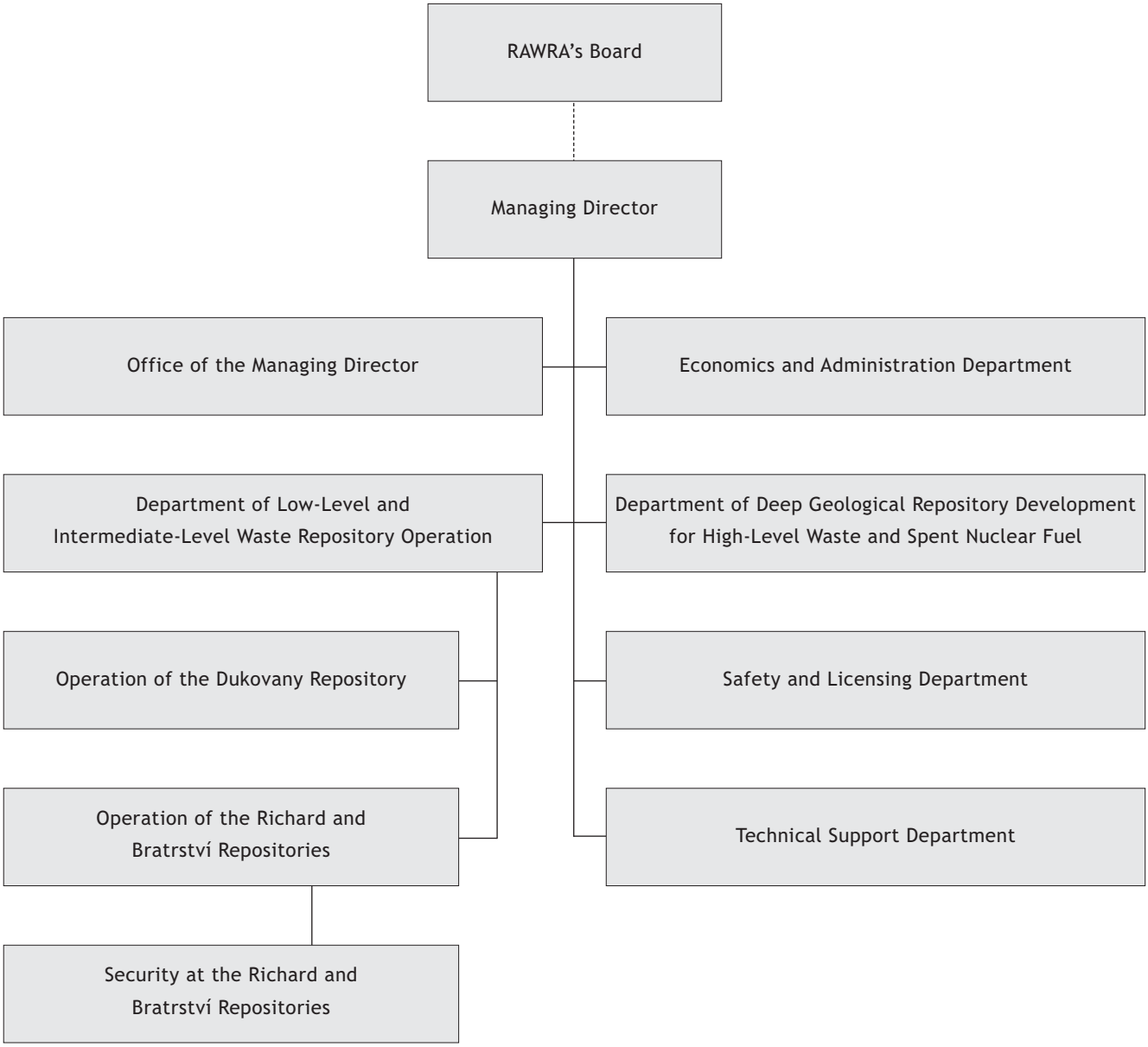
Mr. František Pazdera
Director General of the Nuclear Research Institute, Řež
represents radioactive waste producers outside the nuclear power sector

Mr. Ladislav Štěpánek
Vice-Chairman of the Board
Director of the Fuel Cycle Section at ČEZ
represents radioactive waste producers in the nuclear power sector

Mr. Ivo Kouklík
Director of the Technical Development and Project Administration Section at ČEZ
represents radioactive waste producers in the nuclear power sector

Mr. Václav Urbánek
Technical Director and Supervisory Board Chairman at CHEMCOMEX PRAHA
represents radioactive waste producers outside the nuclear power sector

RAWRA'S ORGANISATIONAL CHART



Upper row, from left to right
Karel Kunc, Jaroslav Jelínek, Jiří Soudek, Miroslav Kučerka, Jozef Harčarik, Jiří Slovák, Jiří Faltejsek, Václav Trhlík, Věra Šumberová, Miloš Janů, Eva Šebestová, Ivana Kédlová, Vítězslav Duda, Michal Kaliba, Milan Dvořák

Lower row, from left to right:
Jana Petrová, Zdenka Čmielová, Soňa Konopásková, Jitka Mikšová, Martina Ligaunová, Jana Šoltésová, Jana Irinkovová

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SÚRAO

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