

Joint Convention
Answers on Questions to Hungary in 2009

Q.No 1	Article General	Ref. in National Report Annex 1
Question/ Comment	Could Hungary explain the purpose of informing readers of a maximum temperature values for fuel cladding of 410 degrees Celsius if, as the report states, “During storage the temperature of the fuel cladding is not measured”?	
Answer	The passive, natural draught-based cooling used at the Interim Spent Fuel Storage Facility (ISFSF) is a reliable system. Based on the analysis, the maximum temperature of the cladding that shall be exceeded neither under normal nor incidental circumstances was determined to be 410°C. The storage facility is permitted to receive only those fuel assemblies for which the safety assessment proved that they will not be overheated. The temperature analysis of the fuel assemblies for the entire handling sequence of the assemblies is based on conservative assumptions, which provides reasonable reserve, hence the direct measurement of this parameter during operation is not needed.	
Q.No 2	Article General	Ref. in National Report Annex 4
Question/ Comment	The report states that the Hungarian Ministerial Decree 47/2003. (VIII. 8.) ESZCSM “on issues of interim storage and final disposal of radioactive wastes, and on certain radiohygiene issues of naturally occurring radioactive materials concentrating during industrial activity” is relevant to the Convention. This seems to be in contradiction with the statement which appears page 17 of the report (Section C) and which reads “any waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle is not radioactive waste from the viewpoint of the Convention”. Could Hungary explain if both statements are in contradiction?	
Answer	The statements are not in contradiction. The scope of the Ministerial Decree 47/2003. (VIII. 8.) ESZCSM includes certain radiation protection issues of naturally occurring radioactive materials concentrating during industrial activity, but it is also the most important regulation of radioactive waste management, therefore relevant to the Convention. Article 3 (2) of the Convention reads: „This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.” In line with this statement the Hungarian National Report excludes from its scope any waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle.	

Q.No 3	Article General	Ref. in National Report Annex 7
Question/ Comment	The report states that the radiation protection requirements for radon concentration, gamma dose-rate and activity concentration of soil (two requirements) are inclusive of the “background” values. Could Hungary provide information on the actual value for each of the backgrounds considered?	
Answer	<p>A) The background values for the mentioned radiological parameters (country averages) as assessed by the National Research Institute for Radiobiology and Radiohygiene are listed below:</p> <ul style="list-style-type: none"> – ambient gamma dose rate (outdoors): 86 nGy/h, – ²²²Rn concentration in air for dose calculation (outdoors): 10 Bq/m³, – specific activity concentration of soil (in ²²⁶Ra equivalent): 97 Bq/kg. <p>B) The local background values may differ from those values. At the region of former uranium mines (Mecsek Hills, southwest Hungary) the background values are determined by the Environmental Licence of remediation works. These values are:</p> <ul style="list-style-type: none"> – ambient gamma dose rate (outdoors): 250 nGy/h, – ²²²Rn concentration in air: 12 Bq/m³ (outdoors), – specific activity concentration of soil (in ²²⁶Ra equivalent): 180 Bq/kg. <p>Only areas where the above background values were fulfilled can be used <i>without any restriction</i>.</p> <p>On remediated areas for <i>restricted use</i> (waste rock piles, tailing ponds) the radiological requirements are related to the regional natural background (as listed above). The requirements were derived from the 1 mSv/year official Hungarian population dose limit, as listed below:</p> <ul style="list-style-type: none"> – ambient gamma dose rate (outdoors): background + 200 nGy/h (=450 nGy/h), – ²²²Rn concentration in air: (outdoors): background + 30 Bq/m³ (=42 Bq/m³), – specific activity concentration of soil (in ²²⁶Ra equivalent) in the upper 15 cm layer: background + 180 Bq/kg (=360 Bq/kg). – specific activity concentration of soil below 15 cm: background + 550 Bq/kg (=730 Bq/kg). 	
Q.No 4	Article General	Ref. in National Report Annex 7
Question/ Comment	The report states that the radiation protection requirement for the radon concentration inside buildings is 1000 Bq/m ³ . Techniques to reduce radon concentrations well below 1000 Bq/m ³ exist. Could Hungary indicate if it is intending to reduce radon concentrations inside buildings to a concentration as low as reasonably achievable (ALARA principle)? Can Hungary elaborate on what radon standards apply to occupied homes and workplaces in the vicinity of closed uranium mines?	

Answer	<p>In Hungary the official limit of ^{222}Rn concentration in workplaces is 1000 Bq/m^3 (yearly average, during work time). For the population, no regulation exists in Hungary. In case of a radon problem, recommendations of ICRP-65 are taken into account.</p> <p>Naturally, in our U remediation works we did our best to decrease the radon concentration (first of all indoors) as low as reasonably achievable (ALARA). Special techniques are applied for the decrease of indoor radon level on the former U mining areas, for example continuous pumping out the soil gas below the buildings, passive or active ventilation using perforated drain-tubes in the basement, applying special “radon-proof” isolation resin on the floor etc.</p> <p>Regulations concerning radon dose to population is in preparation phase in Hungary (400 Bq/m^3 limit in old buildings and 200 Bq/m^3 in the new ones is recommended). From the point of view of radon risk there is no difference between former U mining and other (inactive) areas.</p>	
Q.No 5	Article General	Ref. in National Report Para G.1, page 47
Question/ Comment	<p>”Based on operational experience and the safety enhancing measures, the Final Safety Analysis Report is required to be revised by the licensee every year”. Does Regulator examine the revision of Final Safety Analysis Report every year?</p>	
Answer	<p>According to the legal provisions, ‘the Licensee shall annually update the Final Safety Report in accordance with the changes of the nuclear facility’ (Govt. Decree 89/2005, Section 19 (2)). So this is not a comprehensive update of the FSAR, but focuses mostly on the modifications. Priorly, the draft of the text must be submitted to the authority in the course of licensing the modifications, as part of the licensing procedure. The annually updated FSAR has been reviewed and approved by the HAEA.</p>	
Q.No 6	Article General	Ref. in National Report Para J, page 59
Question/ Comment	<p>“Modification of the accountancy system is currently in progress. One of the substantial modifications is the introduction of specific provisions for radioactive waste.</p> <p>What are the new specific provisions for radioactive waste that are introduced into the accountancy system?</p>	
Answer	<p>By the modification it has been enforced that the accountancy system shall comply with the IAEA’s radioactive waste categorization scheme. If necessary the possibility of using additional categorization schemes (i.g.: surface dose rate etc.) is kept open.</p>	
Q.No 7	Article General	Ref. in National Report Annex 2, page 72
Question/ Comment	<p>During inspections, the authority supervises the site itself and does sampling in the vicinity of the site.</p> <p>Which organizations do make measurements of the samples?</p>	

Answer	With regard to issues concerning radiation protection the related tasks are dealt with by regionally competent institutes (regional radiological centres) of the National Public Health and Medical Officer Service according to the relevant governmental decree.	
Q.No 8	Article General	Ref. in National Report Para F.4, page 41
Question/ Comment	How is the internal dose of personnel controlled? What is the contribution of internal dose to the total dose for the personnel that manage radioactive waste and spent fuel?	
Answer	<p><u>Radioactive Waste Treatment and Disposal Facility (Püspökszilágy):</u></p> <p>The designated staff – those potentially mostly at risk – are regularly checked for internal radiation exposure. In 2008, 11 workers were subject for whole body counting and excretion analyses. The investigations so far have not identified gamma-emitting radionuclides of artificial origin. Slightly elevated tritium concentrations in the urine samples have been detected only in a few cases. The doses calculated for these levels were 1- 2 microSv.</p> <p><u>Interim Spent Fuel Storage Facility (Paks):</u></p> <p>Checking of the internal radiation exposure of the operational and maintenance staff is carried out as follows:</p> <ul style="list-style-type: none"> - Those who work permanently in the facility during the emplacement operations are subject to internal radiation exposure control monthly in addition to the checks carried out prior to and after fuel transfer operations. - Checking of those performing activities only occasionally in the controlled zone, is carried out – should the location and type of work justify the check – twice a year. - In case of suspicion of incorporation, the worker is instructed for an out-of-order internal radiation exposure check. <p>Internal radiation exposure is checked by use of the following methods:</p> <ul style="list-style-type: none"> - lung measurement, - thyroid counting, - whole body counting, - tritium concentration measurement in urine samples. 	
Q.No 9	Article General	Ref. in National Report Para Í.2, page 53
Question/ Comment	Could you describe the system of managing of spent filter materials? For example, are the resins conditioned?	

Answer	From the beginning of the operation the resin is being stored in tanks and conditioning has not started yet. Cementation is the projected way of conditioning.	
Q.No 10	Article General	Ref. in National Report Para J, page 59
Question/ Comment	It is stated that if requested, Hungarian manufacturers take back radioactive sources produced by them from users within the country or abroad." Does the price of these sources include future costs of disposal in Hungary? If yes – how future costs are calculated (some sources will be returned after tens of years)?	
Answer	Whenever a manufacturer takes back a radioactive source the disposal is one of the possible options. Would it be the case, the price is at the discretion of the manufacturer.	
Q.No 11	Article Article 4	Ref. in National Report page 11
Question/ Comment	In relation to the "Updated concept of the long term..." are there any considerations for a regional repository solution?	
Answer	The preferred option (reference scenario) used for the calculation of the long term liability of Paks NPP in the medium- and long term plan (approved by the minister in charge) is the domestic deep geological disposal, but several other options are also kept open. The international efforts to develop a regional repository concept are followed by Hungary with interest.	
Q.No 12	Article Article 5	Ref. in National Report
Question/ Comment	Are any comprehensive safety evaluations for the RWTDF being carried out after the temporary operation licence has been expired? When will a long term or permanent licence be issued?	
Answer	The first safety assessment of the site was performed in 2000, and a safety reevaluation of it was carried out in 2002. Based on that and on the Waste Acceptance Criteria developed in 2004 the authority has granted the licence for operation for ten years, the longest possible period of time permitted in the relevant Decree 47/2003. (VIII. 8.) issued by the Minister for health. The licence is renewable.	

Q.No 13	Article Article 6	Ref. in National Report G.1
Question/ Comment	What are the values of vertical acceleration of a design earthquake and for a maximum design earthquake? Do you have a requirement for the ground response spectrum for the values of peak ground acceleration including damping ratio? If so, please tell more about it.	
Answer	<p>Highest free-surface-horizontal-acceleration of the <u>maximum design earthquake</u>: 0.35g, occurrence probability: 10^{-4} /yr.</p> <p>The highest vertical groundsurface acceleration in case of the <u>maximum design earthquake</u>: 0.23g.</p> <p>Highest free-surface-horizontal-acceleration of the <u>design basis earthquake</u>: 0.08g.</p> <p>In case of design basis earthquake the highest vertical groundsurface acceleration: 0.05g.</p> <p>The <u>maximum design earthquake</u> of 0.35g was set based on the highest free-surface-horizontal-acceleration. This input was applied for the building structures taking into account the USA NRC Regulatory Guide 1.60, as well as the attenuation values given in ASCE 4/86 prescriptions [American society of civil engineers: ASCE 4-86: Seismic analysis of safety related nuclear structures and commentary on standard for seismic analysis of safety related nuclear structures. September 1986.].</p> <p>The design bases of the Interim Spent Fuel Storage Facility from seismic aspect are as follows:</p> <p>I. Every component required to contribute to the safety functions of the Interim Spent Fuel Storage Facility was designed to withstand the effects of the highest designed basis earthquake (0.35g).</p> <p>These equipment are required to:</p> <ol style="list-style-type: none"> a) maintain the isolation of the fuel assemblies, b) prevent criticality, c) prevent radioactive releases above the limits, d) ensure the carrying-capacity of those components which are located along the handling route of the fuel assemblies. <p>II. Every device not belonging to the group I. but prevents the escape of radioactivity above the permitted normal operational limit has been designed to withstand the design basis earthquake (0.08g).</p>	
Q.No 14	Article Article 6	Ref. in National Report G1, p.47
Question/ Comment	Where do the funds for SNF storage construction come from? Who manages the funding of the SNF storage construction?	

Answer	Costs of spent fuel storage (e.g. the cost of the construction of the Interim Spent Fuel Storage Facility) are financed from the Central Nuclear Financial Fund. The Fund was established by the Act CXVI of 1996 on atomic energy and can be used for radioactive waste disposal, spent fuel storage & disposal and decommissioning of nuclear facilities. The payments into the Fund come mainly from the Paks NPP.	
Q.No 15	Article Article 8	Ref. in National Report G1, p.48
Question/ Comment	What is the design basis accident the SNF storage facility is calculated for and what is the probability of its happening?	
Answer	<p>Earthquake:</p> <p>Highest free-surface-horizontal-acceleration of the <u>design basis earthquake</u>: 0.08g, occurrence probability: 10^{-2} /yr Highest free-surface-horizontal-acceleration of the <u>maximum design earthquake</u>: 0.35g, occurrence probability: 10^{-4} /yr.</p> <p>Extreme environmental features:</p> <p>Highest temperature: +39.0 °C, occurrence probability: 10^{-4} /yr. Lowest temperature: -30.3 °C, occurrence probability: 10^{-4} /yr.</p> <p>Strong wind (gale):</p> <p>Highest wind speed (gust) 48.8 m/sec, occurrence probability: 10^{-4} /yr.</p> <p>Extreme flood:</p> <p>Design basis flood level is 96.36 m above Baltic-sea level, occurrence probability: 10^{-4} /yr.</p>	
Q.No 16	Article Article 9	Ref. in National Report p. 61; Sec. K.1
Question/ Comment	According to the report, a Periodic Safety Review of the Interim Spent Fuel Storage Facility (ISFSF) modules 1-11 was performed in 2008. Could you please specify the main features of this review to ensure long-term safety of the storage facility?	

Answer	The periodic safety review was carried out in 2007 and was concluded successfully in 2008. All of the safety related documents and the condition of the systems, components and the whole facility were reviewed. As the result of this review safety enhancement measurements were defined and prioritized. The majority of these measurements were documentation corrections (e.g. review of the internal procedures, modifying the Fire Protection Standard, updating the site characteristics etc.). There are just few which need technical modification or further analyses (e.g.: updating the control engineering system, environmental qualification of the premises, improving aging management programmes, etc.)	
Q.No 17	Article Article 9	Ref. in National Report p. 61; Sec. K.1
Question/ Comment	<p>According to Annex 8.1.1.d (p. 97-98), the fuel assemblies damaged during the incident at the Paks NPP Unit 2 in April 2003 were loaded into canisters that were designed for a minimum of five years storage in the spent fuel pond. Which technical and/or administrative measures are foreseen to assure the integrity of those canisters during wet storage?</p> <p>The commissioning license for the new Interim Spent Fuel Storage Facility (ISFSF) modules 12-16 was issued by the regulatory authority in 2007. The report says that the ISFSF module 16, having a slightly modified layout for the storage places, may be capable of storing the encapsulated broken fuel elements of the incident at the Paks NPP Unit 2 in April 2003, but that the licensee (PURAM) shall make an extra application for this option, presenting an appropriate safety assessment to the competent authorities. Which technical and/or administrative measures are foreseen to assure the integrity of the canisters during long-term dry interim storage?</p>	
Answer	<p>From technical point of view, the integrity of the capsules (canisters) is guaranteed by certified compliance with the nuclear standards and requirements during the design, licensing and manufacturing work.</p> <p>In addition to accident analyses and the rating for the postulated loads and impacts under off-normal conditions, the preservation of integrity is also supported by the following administrative measures:</p> <ul style="list-style-type: none"> • Peripheral regions of the decay pool have been designated for storing the capsules to minimise the risk of damage potentially resulting from handling of spent fuels. • The risk of damage potentially arising from capsule handling operations is further reduced by a storage and handling plan, which includes a minimum number of capsule handling operations. • The technical and administrative conditions for the safe completion of the unavoidable handling operations are provided. • The reduction of the risk of capsule damage to the minimum is the most important consideration in planning the handling operations. <p>The handling plan and the required handling operations are incorporated into the system of operative handling manuals.</p> <p>Until now no decision has been made on management of the encapsulated damaged fuel elements. Prior to removal the damaged fuels a feasibility study was prepared which studied different long term storage options. One of the options considered was to keep the encapsulated fuel elements in the cooling pond until the end of the life of the NPP, or alternatively transfer the containers to the Interim Spent Fuel</p>	

	<p>Storage Facility.</p> <p>A conceptual study is to be prepared in the years to come that can provide a basis for the longer term storage of the encapsulated fuel elements. This study should evaluate that when and under which circumstances the encapsulated fuel elements can be moved to the Interim Spent Fuel Storage Facility.</p>	
Q.No 18	Article Article 9	Ref. in National Report Section K, Page 61
Question/ Comment	<p>The report states that the new module of the Interim Spent Fuel Storage Facility may be capable of storing the damaged fuel elements or debris from the 2003 incident at Paks NPP. Please describe any steps that must be taken to prepare the waste for storage at the interim facility.</p>	
Answer	<p>Until now no decision has been made on management of the encapsulated damaged fuel elements. Prior to removal the damaged fuels a feasibility study was prepared which studied different long term storage options. One of the options considered was to keep the encapsulated fuel elements in the cooling pond until the end of the life of the NPP, or alternatively transfer the containers to the Interim Spent Fuel Storage Facility.</p> <p>A conceptual study is to be prepared in the years to come that can provide a basis for the longer term storage of the encapsulated fuel elements. This study should evaluate that when and under which circumstances the encapsulated fuel elements can be moved to the Interim Spent Fuel Storage Facility.</p>	
Q.No 19	Article Article 9	Ref. in National Report Section G.1, Page 49
Question/ Comment	<p>Please clarify when operating license for the Interim Spent Fuel Storage Facility will expire. Page 12 indicates that the facility allows for storage up to 50 years, while page 48 states that the license will expire on 31 August 2008. What has transpired since that date?</p>	
Answer	<p>The planned lifetime of the Interim Spent Fuel Storage Facility is 50 years. In line with the regulations, the regulatory body issues licenses only for limited duration, however, they can be extended for further periods. The validity of the first operating license expired on 31 August 2008. The first Periodic Safety Review has been performed for the storage modules 1-11 of the facility. Based on this review and the review of the Final Safety Analysis Report of the 1-16 modules an extended operation license has been issued by the Hungarian Atomic Energy Authority. The current operation license will expire on 31 December 2009. There were no safety or technical reasons to limit the validity of the operational license, but HAEA required significant administrative and editorial changes in the FSAR.</p>	

Q.No 20	Article Article 12	Ref. in National Report H.1
Question/ Comment	What is the current use of Solymar? Are there any land use restrictions regarding the site?	
Answer	Presently, this area is used by a shopping centre (park and parking area). The site has been declared by the regulatory body usable, but with some restrictions. The border of this site has to be marked and the use of the area of Solymár site is to be restricted that means the deep building construction (more than 1 m of depth) has been prohibited on this area. Furthermore, one monitoring well is monitored by the Middle Hungarian Regional Institute of National Public Health and Medical Officer Service.	
Q.No 21	Article Article 13	Ref. in National Report p. 10-11; Sec. B.1.1
Question/ Comment	Could you please give some information on how the public opinion will be regarded in the siting process for a high level waste (HLW) disposal facility in the area under consideration (Boda Claystone formation)?	
Answer	<p>Municipality of Boda was supportive during the earlier investigations carried out between 1995 and 1998 at 1100 m depth. As of 1996 a group was created (West Mecsek Public Information Association or NyMTIT) allowing the implementer (PURAM) to channel incentives and information. Today it is comprising 9 settlements located in the investigation area for the HLW repository and serving a total of 7,500 persons. The main task of the NyMTIT is familiarizing the public with the underground exploration and research programme. As well, the association maintains an environmental monitoring network and fosters the protection, restoration and replanting of areas affected by investigation activities.</p> <p>The Association maintains a public information office where documentary materials can be found. Meetings are held in each settlement, and a road show lasting one month visited eleven locations, providing information and establishing personal contacts. "Information parks" have been constructed; historic information is displayed on panels placed alongside walking paths. Schools visits to sites are organised in order to familiarise future decision makers with waste management activities. A quarterly newspaper, the West Mecsek Compass, is issued to each household free of charge. Each municipality has its own monthly publication, reporting local news and developments from schools or institutions, along with the agenda of scientific and other meetings. This information is available on-line. A cable TV network serves all these settlements, allowing real-time monitoring of the investigation sites.</p> <p>Because civil society needs information from reliable experts to participate in waste management, the Association contacted the Hungarian Academy of Sciences to provide input, including translation of the technical issues into everyday language and double-checking of environmental measurements.</p>	

	<p>Boda's representatives participated in the EC-sponsored COWAM 2 programme. It was very helpful for them to learn from foreign peers about the thinking and practices in their countries. Because NYMTIT representatives have been active since 1996, they were able to make a particular contribution to the COWAM 2 publication "Roadmap for local committee construction".</p> <p>Two local organizations have become full members of the GMF, the European grouping of nuclear host communities and already hosted their visits. GMF acknowledged Hungarian efforts by holding its presidium meeting in NyMTIT headquarters in the very first year of their joining. Local residents have made study trips and attended GMF conferences in several countries.</p> <p>The NyMTIT gained access in 2006 to the lobby group of the Parliament of the Hungarian Republic. The association can study and comment on new legal regulations before they are debated, and explain local positions to national politicians.</p> <p>Public polls performed in 2003 and 2005 indicated a high level of awareness among local residents about the repository activities.</p>	
Q.No 22	Article Article 16	Ref. in National Report H.2
Question/ Comment	What is being understood under the term "critical" type RAW?	
Answer	The safety case indicated that after the active institutional control period certain disused sealed sources (mainly those containing long-lived radionuclides and some higher activity radiation sources with activity of several tens of GBq) – could impose high doses – exceeding the limit – to individuals who intrude into the facility, and they could also lead to doses greater than the limit following any future disruption of the repository by natural processes. These waste streams are regarded as "critical" type RAW"; critical from long-term safety point of view.	
Q.No 23	Article Article 16	Ref. in National Report H.3
Question/ Comment	Is there a requirement for co-ordination with the regulatory authority in case of modification of the cementation procedure of liquid RAW? Does this lead to an amendment in the license?	
Answer	If the modification of the cementation procedure of liquid radioactive waste results in an end-product that is not fulfilling the waste acceptance criteria for the National Radioactive Waste Repository, a previous co-ordination with the regulatory authority and a subsequent licensing is necessary.	

Q.No 24	Article Article 16	Ref. in National Report
Question/ Comment	Provide information on the methodology for the derivation of waste acceptance criteria for modified Püspökszilágy disposal facility.	
Answer	<p>Site-specific waste acceptance criteria based on operational and post-closure safety considerations, were developed. Justified and practical criteria are used both for future disposals and the re-disposal of any retrieved waste.</p> <p>To develop the activity limits two methodologies were examined:</p> <p>(1) consideration of a fire incident in the storage building for derivation of WAC concerning storage and</p> <p>(2) post-closure safety assessment for derivation of WAC concerning disposal.</p> <p>Different total activity and maximum activity-concentration limits has been defined for final disposal and interim storage.</p> <p>To develop the physical, chemical characteristics of the waste form and waste packages the post-closure safety assessment was validated and prescribed also for interim storage of solid waste. Regarding interim storage of nuclear materials and disused sealed sources the waste packages used are prescribed.</p>	
Q.No 25	Article Article 16	Ref. in National Report
Question/ Comment	Why was the Solymár facility not released for unrestricted use and what kind of controls are maintained to ensure the protection of human health and the environment? Who implements these controls?	
Answer	<p>The Solymár facility is not released for full unrestricted use, because a little contamination was found on the surface and bottom of few storage wells during decommissioning. Though, all contamination was removed and the contaminated material was transported to the Püspökszilágy facility, but the authority prescribed precaution measures (the border of this site has to be marked, the deep building construction (more than 1 m of depth) has been prohibited). On this site, one well is monitored by the Middle Hungarian Regional Institute of National Public Health and Medical Officer Service.</p>	
Q.No 26	Article Article 18	Ref. in National Report E.1, p. 26
Question/ Comment	Do radiological safety criteria set up by the Ministry of health differ from the criteria adopted by Hungarian Atomic Energy Authority, the Ministry of environmental protection and Ministry of agriculture?	

Answer	<p>Going a little bit deeper in the structure which allocates regulatory tasks to several ministries, we see the different spheres of responsibilities. The environmental licenses of the nuclear installations are key documents. These licenses had been issued with the contribution of the Health Authority (National Public Health and Medical Officer Service). In case of the NPP, the Health Authority established the dose constraint as 90μSv/year. The Environment Authority took the emissions pertaining to the normal operation according to the design basis, and determined the values of radioactive material emissions to the air, to the waters and to the soil, according to the 90μSv/year dose constraint. These determined values are in the appendix of the Technical Specification of the plant, and serve as the basis of environmental monitoring.</p> <p>The Agriculture Authority is responsible for the food chain. Since there is no agricultural production around the nuclear installations, the radioactive and poisoning material limits (dimension e.g. mg/kg) related to nutrition products are not relevant among the circumstances of normal operation, however, nutrition limit values are established and legally binding. The Agriculture Authority has special responsibility in severe accident scenarios, when they decide and control the utilization of food stuff and feeding stuff potentially arriving from such areas which were affected by the contamination of radioactive material falling out.</p> <p>The Agriculture Authority takes biological samples periodically from plants, vegetables and animals (sheep, cow, fish) in the neighborhood of installations for the purposes of laboratory analysis. The NPP keeps living stock in the surrounding area of the nuclear units, while fishes can be caught in the cooling water channels and Danube river to support the laboratory sample taking.</p>	
Q.No 27	Article Article 19	Ref. in National Report Page 26
Question/ Comment	<p>The Act on Atomic Energy establishes a division of authority, the HAEA (for spent fuel) and the Minister responsible for health (at present, the National Public Health and Medical Officer Service) (for radioactive waste management).</p> <p>a) How do the regulatory bodies coordinate the sharing of information and are there ways that they harmonize?</p> <p>b) Has there been any consideration to establishing one licensing authority?</p>	
Answer	<p>During the licensing procedures the two authorities are in co-authority relationship in those cases which are listed in the law. The co-authority relationship and the contribution to each others decision making are determined by the law. The information exchange has further periodical and occasional opportunities, too.</p> <p>The rationalization of the state authority procedures has become governmental intention during the recent years. The restructuring intention may lead to that consequence, that the regulatory tasks of nuclear facilities and radioactive waste management facilities will be executed by one authority organization, instead of two. International examples are taken into consideration, as well (e.g Finland, Sweden).</p>	
Q.No 28	Article Article 19	Ref. in National Report Page 31 (E.3.1)
Question/ Comment	Hungary describes the licensing procedure for a spent fuel management facility. Are there opportunities for public involvement during the licensing procedure?	

Answer	According to the current legal provisions, there is no obligation to involve the public into the licensing procedure on nuclear safety issues. The environmental licensing procedure is quite different, e.g. a civil organisation has the opportunity to take part the public hearings.	
Q.No 29	Article Article 19	Ref. in National Report
Question/ Comment	The Report indicates that “a ministerial decree [III.4] prescribes the methodology and geological requirements of site selection“. Please explain what geotechnical tools are commonly used for investigations, i.e., borings, cone penetrometer, etc.? What in-situ tests are commonly used (for example cone penetrometer, dilatometer, pressuremeter, etc.)?	
Answer	<p>During the ground-based geological exploration (20023-2003) some 23 boreholes were prepared. Various geophysical, hydro-geological, geological and structural studies were carried out in the boreholes during drilling, partly after it. For the refinement of the position and the dip of the fracture zone and for studying its connection with the zone having the hydrodynamic head two inclined boreholes were drilled. Well-logging, hydrodynamic testing and water sampling were carried out in the boreholes. After finishing drilling, tracer and interference studies alongside additional downhole geophysical measurements, and also cross-hole seismic measurements were carried out. Geological and tectonic logging, core scanning and – partly – geotechnical documentation of the cores were completed.</p> <p>Well-logging and hydrodynamic scan tests were always carried out in the sections which were then open, when the drilling was interrupted for different reasons or when the drilling was completed. Complex geophysical well-logging was carried out along the whole section of the borehole, whereas acoustic well-logging was performed in the bedrock. Heat-pulse flowmetry (HPF) was made only in the vertical boreholes, mainly in the bedrock. In the shallow boreholes absorption testing and water sampling were carried out. After finishing the drilling, multi-packer hydrodynamic interference tests were carried out between the boreholes in the site with three different marker boreholes. In the case of borehole groups, tracer test were carried out. There were complementary geophysical surveys in the boreholes and cross-hole seismic tomography. One institute conducted seismic (PSQ/PQ) and radar measurements in the borehole and cross-hole velocity and absorption tomography. In-situ fragmentation measurements (RQD and Kiruna measurements) were carried out on the drill core material, as part of the technical supervision.</p> <p>A significant ground-based geophysical survey activity was carried out at the Bátaapáti site and its vicinity. The spatial homogeneity of the granite was investigated by means of a seismic and magneto-telluric survey in the vicinity of the site. Fractures were investigated with complex electromagnetic and magnetic surveys in the valleys bottoms. The fracture zone which was expected to be the most significant was surveyed with a series of electromagnetic and direct current resistivity profiles. The granite’s surface was mapped with electromagnetic soundings completed with direct current soundings and multielectrode profiling (electric imaging). Possible neotectonic events were searched for with tracing the magnetic horizons connected with palaeosols and application of cone penetration tests (CPTe).</p>	

Q.No 30	Article Article 19	Ref. in National Report
Question/ Comment	The Report indicates agreement between Nuclear Authority and scientific institutions. How does Nuclear Authority obtain independent expertise if the corresponding scientific institution also works for the industry?	
Answer	All scientific institutions working for the HAEA are requested to fill in and later on regularly update a questionnaire mapping their specific technical-scientific areas. Based on the responses to the questionnaire a data base of different technical-scientific areas has been developed and is being maintained at the HAEA indicating what scientific institutions are available in which technical-scientific areas. In summary the data base shows that at least two-three independent institutions are available in each major technical-scientific areas. In case if a submittal is known being elaborated by Institute A on the licensee side then Institute B will be requested to provide independent support in that same topic to the regulatory side. In that very rare situation, when a specific expertise is available only at one institution, which has been involved preliminary on the side of the licensee, then according to its bilateral agreement with HAEA the institution provides the requested technical support by those experts who were not involved in the given issue on the licensee side.	
Q.No 31	Article Article 19	Ref. in National Report E.1.2
Question/ Comment	p. 27 Please clarify the requirements for partial safety report; how the partial safety report differs from the full-scale safety report.	
Answer	According to the Decree 47/2003. (VIII. 8.) issued by the Minister for health, full scale safety report is needed for licensing of establishment, operation and closure of disposal facility. Partial safety report should be prepared for licensing of alteration of licensed activities, start and termination of institutional control. Nevertheless, if any modification of a disposal facility is performed with changes in relevant safety elements then a partial safety report is needed, too.	
Q.No 32	Article Article 19	Ref. in National Report E, p.26
Question/ Comment	Does the sharing of regulatory responsibilities influence on the amount of licensing procedures (number of licenses which are to be granted to the operators)? How many licenses and what types of licenses are necessary for the operators working in the field of RW management regarding nuclear installations, radiation sources, storage facilities?	

Answer	<p>Construction of a new, spent fuel storage or a radioactive waste repository always requires an environmental licensing procedure based on an environmental impact assessment. Act on Environment Protection also calls for hearings of citizens in local and neighbouring municipalities and of other interested groups. These issues are within the competence of the minister responsible for environmental protection.</p> <p>Within the licensing procedures of the nuclear safety authority (Hungarian Atomic Energy Authority), and the regulatory body responsible for licensing non-nuclear facilities (e.g. radioactive waste repositories) and other uses of radioactive material (the National Public Health and Medical Officer Service), the specific aspects are dealt with by the special authorities designated by law (Act CXVI of 1996 on Atomic Energy). See also E.3.2 of the National Report.</p>	
Q.No 33	Article Article 19	Ref. in National Report E.2.1, fig. E.2.1-1, p.29
Question/ Comment	<p>Which Minister supervises the Director General of the HAEA (as indicates on the fig.)? What are duties and responsibilities of that Minister as a whole?</p>	
Answer	<p>As regulated by the Act CXVI of 1996 on Atomic Energy, in matters related to the peaceful use of atomic energy, the Hungarian Atomic Energy Authority (HAEA) is a government organization with national jurisdiction that is directed by the Government and having independent duties and regulatory authorisations. It shall be supervised on behalf of the Government by a Minister appointed by the Prime Minister. At present the appointed minister is the Minister for Transport, Telecommunication and Energy. The HAEA shall not accept any instructions concerning the tasks and duties conferred upon it by law, and its decisions shall not be altered or overruled under supervisory competence.</p> <p>The appointed minister</p> <ul style="list-style-type: none"> - represents the HAEA before Government and Parliament, - issues decrees (if authorized by Government or Parliament) in matters belonging among the duties of the HAEA, - has the jurisdiction over the Central Nuclear Financial Fund (managed by the HAEA). 	
Q.No 34	Article Article 20	Ref. in National Report page 29
Question/ Comment	<p>In chapter “The Hungarian Atomic Energy Authority” you say that the Hungarian Atomic Energy Authority is under supervision of the Government, and Figure E.2.1-1 (Organizational structure) shows that there is also supervising minister. Can you please specify which ministry (or minister) supervises the Hungarian Atomic Energy Authority.</p>	

Answer	As regulated by Act CXVI of 1996 on Atomic Energy, in matters related to the peaceful use of atomic energy, the Hungarian Atomic Energy Authority (HAEA) is a government organization with national jurisdiction that is directed by the Government and having independent duties and regulatory authorisations. It shall be supervised on behalf of the Government by a Minister appointed by the Prime Minister. At present the appointed minister is the Minister for Transport, Telecommunication and Energy. The HAEA shall not accept any instructions concerning the tasks and duties conferred upon it by law, and its decisions shall not be altered or overruled under supervisory competence.	
Q.No 35	Article Article 20	Ref. in National Report E.2.1
Question/ Comment	Fig E.2.1-1 To whose responsibilities belong waste management issues? Is the Scientific Council (p.30) same as the Scientific Board in Fig E.2.1-1 or is it a different body? Can the members of the Council and Board work also for PURAM or is this restricted somehow?	
Answer	<p>Act CXVI of 1996 on Atomic Energy and its executive orders allocate the regulatory and licensing responsibilities as follows: the principal licensing and supervising authority for nuclear facilities (called also nuclear installations) is the Hungarian Atomic Energy Authority; with regard to radioactive waste management it is an organization appointed by the Minister for health (at present, it is the National Public Health and Medical Officer Service).</p> <p>Act CXVI of 1996 on Atomic Energy defines nuclear facilities in the same way as the verification agreements concluded between the International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on the Non-proliferation of Nuclear Weapons:</p> <ul style="list-style-type: none"> a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or b) any location where nuclear material in amounts greater than one effective kilogram is customarily used. <p>Facilities of spent fuel management are nuclear facilities (e.g.: the Interim Spent Fuel Storage Facility) and fall under the regulatory jurisdiction of HAEA, radioactive waste repositories (as non-nuclear facilities) are licensed by the National Public Health and Medical Officer Service.</p> <p>The Scientific Board in Fig E.2.1-1 is the same body as the Scientific Council referred to in the text (the translation in English was not consequent). The Scientific Council deals with major issues of principles within the scope of authority of HAEA, and Members of the Council can give expert opinion also to PURAM in practical matters of radioactive waste management.</p>	
Q.No 36	Article Article 20	Ref. in National Report E.4
Question/ Comment	p. 32 “The Hungarian Atomic Energy Authority evaluates annually the safety performance of all licensees based on the results of a Safety Performance Indicator System”. Is this applied also to waste management and what are these indicators?	

Answer	<p>After 6 years experience of Safety Performance Indicator (SPI) system of NPP, HAEA developed a SPI system to monitor activity of the spent fuel storage. SPI was developed on the basis of IAEA TECDOC-1141. Hierarchical structure of SPI system contains 4 levels (18 strategic indicators, 10 overall indicators, 3 main areas). On the top of the structure there are three main safety areas characterizing the Smooth Operation, the Risk of the Operation of the spent fuel storage and Attitude Towards Safety.</p> <p>Thresholds were determined to every indicator for acceptability and unacceptability that helps to assess trends. Results of SPI assessment are presented in the Annual Report on Licensee's Safety Evaluation. Some indicators for example: Adequacy of movement of fuel elements, Performance of the gas system, Parity of the plan of storage, Events, Radioactive releases (airborne and liquid), Solid radioactive waste generated, TS violation, Human error, Collective dose, Fire etc.)</p>	
Q.No 37	Article Article 20	Ref. in National Report E.4, E.5
Question/ Comment	p. 33 "...the authority has a reporting obligation." p. 32 "...the authorities operate a reporting system." Please tell more about the reporting system and reporting obligations.	
Answer	<p>Details of the reporting system (scope, frequency etc.) operated by the authorities are defined in the relevant regulations, obligatory for the licensees. The reports of the licensees support the work of the authorities.</p> <p>Each Authority and citizen have denunciation obligation to report to the relevant authorities (e.g. police) any kind of violation if it is in cases falling under the Penal Code.</p>	
Q.No 38	Article Article 20	Ref. in National Report E.3, p.31
Question/ Comment	<p>What organization reviews safety related documentation for different licensed activities and facilities?</p> <p>What is the funding source (resource) to perform the safety review?</p>	
Answer	<p>Act CXVI of 1996 on Atomic Energy and its executive orders allocate the regulatory and licensing responsibilities as follows: the principal licensing and supervising authority for nuclear facilities (called also nuclear installations) is the Hungarian Atomic Energy Authority; with regard to radioactive waste management it is an organization appointed by the Minister for health (at present, it is the National Public Health and Medical Officer Service).</p> <p>Act CXVI of 1996 on Atomic Energy defines nuclear facilities in the same way as the verification agreements concluded between the International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on the Non-proliferation of Nuclear Weapons:</p>	

	<p>a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or</p> <p>b) any location where nuclear material in amounts greater than one effective kilogram is customarily used.</p> <p>Facilities of spent fuel management are nuclear facilities (e.g.: the Interim Spent Fuel Storage Facility) and fall under the regulatory jurisdiction of HAEA, radioactive waste repositories (as non-nuclear facilities) are licensed by the National Public Health and Medical Officer Service.</p> <p>The safety related documentation for different licensed activities and facilities is reviewed by the relevant regulatory body, as explained above. The regulatory bodies charge fees for their regulatory activities to the licensees.</p>	
Q.No 39	Article Article 20	Ref. in National Report E.3.1, p. 31
Question/ Comment	What does “a building and occupancy licenses for buildings and structures” issued by the Nuclear Authority (HAEA) mean?	
Answer	„Building” license is a construction license for buildings and structures: This license is issued before the beginning of the commissioning. The content of the submitted document is the design of the construction, construction technologies and static calculation. „Occupancy” license is a license to take into operation buildings and structures: This license is issued after commissioning when the building is ready for use. The content of the submitted document is the statement of the regulatory bodies (e.g. fire protection, physical protection, etc.) and modified construction plan if it is necessary.	
Q.No 40	Article Article 20	Ref. in National Report page 28
Question/ Comment	Could you describe lessons learned from PSR of radwaste management facility in order to improve further operational safety?	
Answer	The licensing authority granted the licence for operation of the Radioactive Waste Treatment and Disposal Facility in 2005 for ten years, the longest possible period of time, based on the licensing documentation as required by the Ministerial Decree 47/2003. (VIII. 8.), issued by the Minister for health. Therefore no Periodic Safety Review was prepared yet for the facility.	
Q.No 41	Article Article 22	Ref. in National Report Page 91

Question/ Comment	Annex 7 indicates that in the past there were insufficient funds to complete remediation work at the closed uranium mine. a) Is Hungary confident that remediation can be completed with the current budget? b) When will the remediation be completed?	
Answer	The final deadline of the remediation activity in the uranium mining and processing legacy sites – according to the Government Decree No. 2122/2006. (VII.11.) – was 31 December 2008. The remediation works were finished till this date. After the remediation works the responsible organisation (the legal successor of the former mining company) has to continue the long term activity (water treatment, environmental monitoring, maintenance of the remediated sites) probably for several decades. The planned budget of the total activity (1998-2008) was 20.7 billion HUF, indeed the fact was 20.1 billion HUF.	
Q.No 42	Article Article 22	Ref. in National Report F.2.2.2
Question/ Comment	It is explained that payments from Paks NPP to the Fund are proposed by the minister based on the submittals from PURAM. Is the operator of the NPP consulted during the process?	
Answer	Yes, preliminary consultations take place between PURAM and the NPP during the preparation of the medium and long term plan (containing among others the whole budget of the Fund for the next fiscal year). Before handing in the proposal to the minister, it is discussed by an inter-ministerial body extended with the delegates from both PURAM and Paks NPP (Technical Commission of the Central Nuclear Financial Fund). At this forum the NPP's opinion is taken into account, too.	
Q.No 43	Article Article 22	Ref. in National Report F2
Question/ Comment	From the practical and legal point of view what does it mean that radioactive waste management facilities are not considered as nuclear facilities? What is the difference between nuclear installation and nuclear facility according to Hungarian legislation? Both terms are used in the report (e.g. p. 25, 37).	
Answer	<p>Act CXVI of 1996 on Atomic Energy and its executive orders allocate the regulatory and licensing responsibilities as follows: the principal licensing and supervising authority for nuclear facilities (called also nuclear installations) is the Hungarian Atomic Energy Authority; with regard to radioactive waste management facilities it is an organization appointed by the Minister for health (at present, it is the National Public Health and Medical Officer Service).</p> <p>Act CXVI of 1996 on Atomic Energy defines nuclear facilities in the same way as the verification agreements concluded between the International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on</p>	

	<p>the Non-proliferation of Nuclear Weapons:</p> <p>a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or</p> <p>b) any location where nuclear material in amounts greater than one effective kilogram is customarily used.</p> <p>Facilities of spent fuel management are nuclear facilities (e.g.: the Interim Spent Fuel Storage Facility) and fall under the regulatory jurisdiction of HAEA, radioactive waste repositories (as non-nuclear facilities) are licensed by the National Public Health and Medical Officer Service.</p>	
Q.No 44	Article Article 22	Ref. in National Report F.2.1.1
Question/ Comment	Has the whole liability already been gathered to the Central Nuclear Financial Fund?	
Answer	<p>The Paks NPP contributes to the Fund through annual payments during the NPP's life-time. The payments are calculated so that by the time when the NPP is shut down the amount accumulated in the Fund will be able to cover all predicted costs arising in the future, including the cost of decommissioning. The Government is responsible to preserve the Fund's value and also to make the necessary contribution for decommissioning of the state-run nuclear facilities (research and training reactors) when their decommissioning becomes due.</p> <p>In summary, the whole liability has not been collected yet. Only the time-proportional part has been gathered and the rest part is to be paid during the subsequent years till 2017 when the last unit of the Paks NPP is planned to be shut down. (Here the life-time extension of the Paks NPP is not taken into account yet.)</p>	
Q.No 45	Article Article 22	Ref. in National Report F2.1.1
Question/ Comment	p. 26 says that "...radioactive waste management facilities are not considered as nuclear facilities", p.37 says that "the licensees of nuclear installations are obliged to pay a supervision fee to the Authority..." From which source, the state budget or the Fund, are the inspections to the Radioactive Waste Treatment and Disposal Facility, paid?	
Answer	<p>Act CXVI of 1996 on Atomic Energy and its executive orders allocate the regulatory and licensing responsibilities as follows: the principal licensing and supervising authority for nuclear facilities (called also nuclear installations) is the Hungarian Atomic Energy Authority; with regard to radioactive waste management it is an organization appointed by the Minister for health (at present, it is the National Public Health and Medical Officer Service).</p> <p>Act CXVI of 1996 on Atomic Energy defines nuclear facilities in the same way as the verification agreements concluded between the</p>	

	<p>International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on the Non-proliferation of Nuclear Weapons:</p> <p>a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or</p> <p>b) any location where nuclear material in amounts greater than one effective kilogram is customarily used.</p> <p>The principal licensing and regulatory authority of the Radioactive Waste Treatment and Disposal Facility is the National Public Health and Medical Officer Service, as it is not a nuclear facility. A ministerial decree is regulating the fees to be paid to the National Public Health and Medical Officer Service for any licensing activities, regulatory inspections are financed from the state budget.</p>	
Q.No 46	Article Article 22	Ref. in National Report F2.1.1
Question/ Comment	p. 37 describes large training programme for the Authority personnel. How does PURAM and PAKS NPP educate their personnel? Does the Authority verify competence of the PURAM and PAKS NPP personnel? And if it does, please clarify how.	
Answer	All members of the operating staff hold qualifications and have had the necessary training for carrying out their particular function. Qualifications depend on passing an examination that is either performed within the spent fuel storage facility, like on the job exams (exam in practice) and in front of representatives of the Authority (like oral exam), depending on the potential effect on safety of the particular position. Licensing examinations should be repeated in every 3 years.	
Q.No 47	Article Article 22	Ref. in National Report page 37
Question/ Comment	What are the main reasons for the decreased number of employees at HAEA? Does it influence the duties of the authority?	
Answer	The limited (decreased to 80) number of the employees of the HAEA was determined by central/governmental administrative measures. An other important reason is the centralized system of salaries, established by the Civil Servant Law. This system is not so flexible and attractive as the wage system of the private sphere. Nevertheless the duties of the HAEA and the discharge of the duties stay unchanged.	
Q.No 48	Article Article 22	Ref. in National Report Section F.2.1.1, Page 37
Question/ Comment	The report indicates that HAEA staff responsible for spent fuel management has decreased. Is this decrease significant to safety? Please explain.	

Answer	<p>The limited (decreased to 80) number of the employees of the HAEA was determined by central/governmental administrative measures. An other important reason is the centralized system of salaries, established by the Civil Servant Law. This system is not so flexible and attractive as the wage system of the private sphere. Nevertheless the duties of the HAEA and the discharge of the duties stay unchanged, there is no significant effect to the safety. Recently the trend changed and due to the education plan new, well trained inspectors took up work in this field.</p>	
Q.No 49	Article Article 22	Ref. in National Report Section F.2.1.2, Page 37
Question/ Comment	<p>The report indicates that licensing is conducted by both HAEA (for spent fuel management) and NPHMOS (for radioactive waste management). Please address the consistency of approach taken by these two regulatory authorities.</p>	
Answer	<p>Act CXVI of 1996 on Atomic Energy and its executive orders allocate the regulatory and licensing responsibilities as follows: the principal licensing and supervising authority for nuclear facilities (called also nuclear installations) is the Hungarian Atomic Energy Authority; with regard to radioactive waste management it is an organization appointed by the Minister for health (at present, it is the National Public Health and Medical Officer Service).</p> <p>Act CXVI of 1996 on Atomic Energy defines nuclear facilities in the same way as the verification agreements concluded between the International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on the Non-proliferation of Nuclear Weapons:</p> <ul style="list-style-type: none"> a) a reactor, a critical facility, a conversion plant, a fabrication plant, a reprocessing plant, an isotope separation plant or a separate storage installation; or b) any location where nuclear material in amounts greater than one effective kilogram is customarily used. <p>The effective kilogram is a unit of the amount of nuclear material, depending on its weight and enrichment (see verification agreements)</p> <p>Facilities of spent fuel management are nuclear facilities (e. g. the Interim Spent Fuel Storage Facility) and fall under the regulatory jurisdiction of HAEA, radioactive waste repositories (as non-nuclear facilities) are licensed by the National Public Health and Medical Officer Service.</p> <p>The scope of authority of the two regulatory bodies are different, but the Act on Atomic Energy (basic principles) and the Act on the Rules of Public Administration (procedures) provide for the consistency of their approach.</p> <p>These two regulatory bodies assist each other and involve the other authority in their own process in matters falling under the other's competency.</p>	

Q.No 50	Article Article 24	Ref. in National Report F.4
Question/ Comment	In this section, dose limits have been indicated for the individual effective dose for the population from the discharges (liquid and gaseous) from different nuclear facilities: NPP, interim storage for SNF, facility for reprocessing and storage of RAW. What is the situation when there is more than one nuclear facility on one site? How such kind of situation is regulated?	
Answer	At Paks, Nuclear Power Plant (NPP) and Interim Spent Fuel Storage Facility (ISFSF) are operated on neighbouring sites and the dose constraints for the discharges are different, namely, 90 microSv/y for NPP and 10 microSv/y for ISFSF. The basis of the prescription of dose constraint in the case of more than one facility operating on one site is that the sum of dose constraints should not exceed the order of 100 microSv/y.	
Q.No 51	Article Article 24	Ref. in National Report H.3
Question/ Comment	What type of personal dosimeters are used for measuring the individual doses of the personnel from neutron irradiation?	
Answer	<p><u>At the National Radioactive Waste Repository (Bátaapáti):</u> there is no source for neutron exposure hence no neutron dose meter is needed.</p> <p><u>At the Radioactive Waste Treatment and Disposal Facility (Püspökszilágy):</u> type EPD-N2 manufactured by Thermo Electron Corporation neutron dosimeters are used for detecting individual neutron doses.</p> <p><u>At the Interim Spent Fuel Storage Facility (Paks):</u> No neutron dose meter is used for measuring the individual neutron doses in the storage facility as no neutron exposure can occur.</p>	
Q.No 52	Article Article 24	Ref. in National Report
Question/ Comment	What is the methodology (scenarios, models) for the derivation of dose constraints for different nuclear installations and facilities?	
Answer	Each licensee has to work out the dose assessment of its release (discharges) for different exposure pathways using relevant models and scenarios. On the basis of this assessment the health authority (the Office of the National Chief Medical Officer) grants the dose constraint for the given facility regarding the circumstances (site specification, population,..). On the other hand, the Decree 15/2001. (VI. 6.) issued by the Minister for the environment stipulates the requirements of the release (discharge) from the given facility or nuclear installation, so all relevant radioisotopes have to be considered in the release (discharge) process. The authorised dose constraints have to be applied for the	

derivation of the activity concentration of the different radioisotopes for limiting the release (discharge) into environment (see expressions below). This derivation is also verified on the basis of a study for the different releases and exposure pathways.

Expressions for the determination of release limit:

$$\sum_{ij} \frac{R_{ij}}{EL_{ij}} \leq 1$$

where

EL_{ij} release limit for radionuclide i and release mode j ($Bq\ yr^{-1}$);
 R_{ij} annual release of radionuclide i and release mode j ($Bq\ yr^{-1}$).

and the release limit (EL_{ij}) for radionuclide i and release mode j :

$$EL_{ij} = \frac{1}{\Gamma} \frac{DL}{DE_{ij}} \quad (Bq\ yr^{-1})$$

where

DL dose constraint for the given facility ($Sv\ yr^{-1}$);
 DE_{ij} annual dose due to unit release of radionuclide i through release mode j ($Sv\ yr^{-1} / Bq\ yr^{-1}$);
 Γ safety factor for taking into consideration the uncertainty of the derivation process ($\Gamma \leq 5$).

Q.No 53	Article Article 24	Ref. in National Report
Question/ Comment	How is the ALARA principle implemented into the radiation protection procedures used in relation with dose constraints?	
Answer	When the dose assessment and the derivation of the activity concentration are prepared then the ALARA is to be considered in these analyses.	
Q.No 54	Article Article 24	Ref. in National Report
Question/ Comment	Are any similar dose constraints values available for occupational exposures of the facility staff?	

Answer	In order to ensure the dose limitation for workers (100 mSv/5y), licensees may set up dose constraints for occupational exposures in their Radiation Protection Rules for Workplace approved by health authority. In spent fuel and radioactive waste management facilities the dose constraint is 20 mSv/y.	
Q.No 55	Article Article 24	Ref. in National Report F.4 Operational radiation protection, se
Question/ Comment	It is noted that Hungary, via the Office of the National Chief Medical Officer, has specified different values of dose constraints for various facilities, ranging from 10 microSv/y (for the Interim Spent Fuel Storage Facility) to 300 microSv/y (for the remediation of the closed uranium mine area). Could Hungary explain the basis for these different values?	
Answer	In Hungary the licensed facilities have different activities, so they have different releases, and there is a difference regarding the site, facilities in their neighbourhood, population, exposure pathways etc., therefore their dose constraints are also different.	
Q.No 56	Article Article 24	Ref. in National Report Section An1.5, Page 67
Question/ Comment	The report states that “most” laboratory inspections at the Interim Spent Fuel Storage Facility are conducted by staff of that facility. What other inspections are conducted? Is there independent verification of the findings from the internal inspections?	
Answer	Other laboratory inspections are implemented by the health physics laboratory of the Paks NPP or by research institutes. E.g.: The internal laboratory inspection is not able to carry out alpha-spectrometry analysis, that is contracted. The independent regulatory control is performed by the South Transdanubian Environmental Protection Inspectorate (Dd KTVF). This regulatory body conducts inspections parallel with those of the operator, by its own means or using the monitoring systems of the operator. Samples collected are analyzed at the Dd KTVF laboratory that is accredited. Discharge data are compared between the regulator and the operator (consistency checks and trend analysis) on a yearly basis. This independent control is part of the Joint Environmental Radiological Monitoring System (JERMS).	
Q.No 57	Article Article 25	Ref. in National Report page 43
Question/ Comment	It was reported that the review of the National Nuclear Emergency Response Plan of 2002 was finished and the plan entered into force in 2008. What are the changes introduced with this review compared to one issued in 2002?	

Answer	<p>There are four sources for modifications in the NERP: legal background, international recommendations, domestic experiences and technical-scientific development. Several legal items were issued in the period of 2003-2007 requiring the modifications in the NERP, the most important were the governmental decree on public communication in emergency and also the act in 2006 restructuring the scope of responsibilities of the governmental system. Major international recommendations were published by the IAEA, like the GS-R-2 and the subsequent EPR series. Domestic experiences were gained from the emergency response exercises in the period 2003-2007, like the full scale National Exercise in 2004, the CONVEX-3-2005, the INEX-3 in 2005 and others. Important experiences were gained as well from the fuel damage severe incident occurred at the Paks NPP in 2003. New assessment tools were developed, new analytical approaches and new communication channels and methodologies were installed, just to mention some items from the area of technical-scientific development, which significantly impacted the preparedness for and response to nuclear or radiological emergencies.</p>	
Q.No 58	Article Article 25	Ref. in National Report
Question/ Comment	Is it usual to delineate emergency response zone? How is this zone delineated around RAW repositories etc.?	
Answer	<p>The size of the Food Restriction Zone around the Interim Spent Fuel Storage (ISFS) is 3 km (other planning zones around the ISFS have not been defined). Similarly, the size of the Food Restriction Zone around the Radioactive Waste Treatment and Disposal Facility (RWTD) located at Püspökszilágy is 3 km (other planning zones around RWTD facility has not been defined).</p>	
Q.No 59	Article Article 25	Ref. in National Report
Question/ Comment	Was the review of the National Nuclear Emergency Response Plan of 2002, which entered into force in 2008, approved by the Governmental Coordination Committee? Who are the members of this Committee?	
Answer	<p>Yes, the new version of the National Nuclear Emergency Response Plan was approved by the Governmental Coordination Committee on its April 2008 meeting. The Chairman of the Governmental Coordination Committee (GCC) is the minister responsible for disaster management. In case of nuclear or radiological emergency the Director general of the HAEA is the Deputy Chairman of the GCC. The full right members (advisory, discussion and decision making) of the GCC are the State Secretaries nominated by the ministries having role in disaster management. There are members with limited rights (advising, discussion and observation) delegated by the different defence organs, like Chairman of the Operative Staff, head of police, disaster management, civil defence. Act LXXIV of 1999 on disaster management and its executive governmental decree 179/1999. (XII. 10.) give more details in general about the roles and responsibilities in disaster management, and the governmental decree 248/1997. (XII. 20.) describes the specificities of the operation of the Hungarian Nuclear Emergency Response System.</p>	

Q.No 60	Article Article 25	Ref. in National Report page 43
Question/ Comment	Can you please provide the number of exercises (local and full scale national) for the last year?	
Answer	<p>HAEA conducted and participated at several types of exercises during 2008.</p> <p>Alerting exercises: 8 (including Convex 1-2 and ECURIE 1-2 exercises)</p> <p>In-house methodical exercises: 2 (radiological, nuclear)</p> <p>Full scope exercises: 3 (CONVEX-3-2008, and national exercise with the Paks NPP, and a transport exercise on discovery of radioactive source)</p>	
Q.No 61	Article Article 26	Ref. in National Report Page 45
Question/ Comment	<p>a) Are decommissioning records a regulatory requirement?</p> <p>b) If yes, how long are they maintained for?</p> <p>c) And who would maintain this information?</p>	
Answer	<p>Currently there is no legal requirement for the decommissioning records, but this topic is partially mentioned in the nuclear safety guide No. 2.14 Quality Management of Decommissioning (issued by the DG of the HAEA). A new volume of the Nuclear Safety Codes, as a legal provision will be published in 2009 covering requirements on decommissioning of nuclear facilities.</p>	
Q.No 62	Article Article 26	Ref. in National Report
Question/ Comment	Can you describe your approach to create financial reserves for decommissioning of nuclear facilities?	
Answer	<p>Act of 1996 on atomic energy established the Central Nuclear Financial Fund (the Fund) in order to finance the present and future cost of, among others, the decommissioning of nuclear facilities. For dismantling the Paks NPP and the Interim Spent Fuel Storage Facility annual contributions to the Fund have to be made by Paks NPP during its whole life-time. The payments are determined by the medium and long term plan (taking into account the decommissioning plans of the facilities) so that the collected amount will cover all the cost associated with the decommissioning activities. The Government is responsible to preserve the Fund's value and also to make the necessary contribution for decommissioning of the state-run nuclear facilities (research and training reactors) when their decommissioning becomes due.</p>	

Q.No 63	Article Article 26	Ref. in National Report Section F.6, Page 45
Question/ Comment	Please summarize decommissioning plans prepared for the Radioactive Waste Treatment and Disposal Facility during your national presentation in May 2009.	
Answer	No decommissioning plan is to be prepared for the Radioactive Waste Treatment and Disposal Facility. Closure of the repository requires a closure plan and a licensing procedure. Closure of the repository is not planned for several decades. Preparation of the closure plan well in advance of the actual termination of the operation is not requested by law.	
Q.No 64	Article Article 27	Ref. in National Report p.57 (I)
Question/ Comment	Section I states that Hungary promulgated a governmental decree on the licensing of shipments of radioactive waste across the national border in 2004. If any, please provide information on the actual experiences and cases of transboundary movements of spent fuel and radioactive waste based upon the Decree.	
Answer	We did not have transboundary movements of radioactive waste since the implementation of the Council Directive 92/3/Euratom of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community by the promulgation of our Governmental Decree No. 155/2004. (V. 14.) Korm. on 14 May 2004 and we did not have transboundary movements of radioactive waste or spent fuel since the implementation of the Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel by the promulgation of our Governmental Decree No. 34/2009. (II. 20.) Korm. on 20 February 2009 therefore we do not have actual experiences.	
Q.No 65	Article Article 28	Ref. in National Report page 59
Question/ Comment	It is stated that the method for determining the fissionable content of PuBe sources is invented to enhance the accuracy of the regulatory accountancy for nuclear materials. Can you please specify some references to find more details about this method.	
Answer	A reasonable summary of the method can be found in the following publication. Nguyen C.T., Bagi J., Lakosi L.: Determining Pu isotopic composition and Pu content of PuBe sources by neutron coincidence technique	

	Nucl. Instr. and Meth. in Phys. Res. B, 262, 75-80. Additional related publications can be found in the references of this paper.	
Q.No 66	Article Article 28	Ref. in National Report Section J.
Question/ Comment	The Hungarian report does not mention the EU HASS Directive. Is this Directive currently implemented in Hungary? If so, can Hungary please elaborate on its experiences in relation to the implementation of the Directive with particular emphasis on any problems that have been encountered?	
Answer	The Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (hereinafter: HASS) is implemented in Hungary. Since 1960s we had got a central registry for radioactive materials (for both sealed and unsealed sources) in which the corresponding threshold was the exemption level instead of the A ₁ value required in the HASS. In 2004 we decided to extend our already existing system to incorporate the related provisions of the HASS instead of implementing it separately. As part of our new approach a computer program for local registries has been provided to licensees by HAEA free of charge, further an internet connection was established for communication between the central registry and local registries. It resulted in an up-to-date and reliable system.	
Q.No 67	Article Article 28	Ref. in National Report page 59
Question/ Comment	The Hungarian legislation requires that unused radioactive sources shall be disposed off. The new reporting system enables the regulatory body to identify sources that have not been used for a longer period of time. Can you please provide information on the basis of which criteria the regulatory body decides of the status of “unused radioactive source”? Does the holder have a right to appeal against such a decision?	
Answer	In fact, the reporting system enables the regulatory authority to track changes in the ownership of a source and to identify the status of it (used or unused) based on the declaration of the licensee. When the authorized life-time expires, the use of the sources is prohibited and the regulatory authority for radiation protection enforces appropriate actions (towards either life time extension or disposal).	
Q.No 68	Article Article 32	Ref. in National Report
Question/ Comment	Where is the institutional radioactive waste stored when the Radioactive Waste Treatment and Disposal Facility (RWTDF) is used to capacity?	

Answer	<p>Based on the findings of the safety assessments, consideration was given to possible developments at the site. After the thorough evaluation of the possible options decision was made to retrieve of certain waste types from the site and put them into interim store, pending disposal in geological repository. Since the free capacity of the repository has run short, an additional task beside the safety enhancement measures is to provide free capacity within the existing facility.</p> <p>During the safety enhancement program waste packages are retrieved from the designated vaults. Materials of safety significance are removed and stored on site pending disposal elsewhere. Condition other materials as necessary, including the application of low-force compaction where appropriate is carried out, and return to the vaults. Further institutional wastes appropriate for disposal in a near-surface facility are buffer-stored on the site pending appropriate conditioning and disposal using the space created by conditioning recovered wastes. The first phase of the safety enhancement program was implemented less than two years and resulted in about 70 m³ free capacity. During this period less the 30 m³ waste was shipped to the facility and put into store in the storage building which can accommodate more than 150 m³ drummed waste.</p>	
Q.No 69	Article Article 32	Ref. in National Report
Question/ Comment	<p>What are the storage capacities in the interim storage at Paks NPP? Have there any estimations of the expected quantity of radioactive waste been undertaken in connection with the existing storage capacities of Paks NPP?</p>	
Answer	<p>The total solid waste capacity is 12800 waste drums. The free capacity is 2600 drums.</p> <p>The main considerations of the estimation of the expected quantity are the following:</p> <ul style="list-style-type: none"> - annually 850 drums produced, - 3000 drums transported to Bataapati final repository up to 2010, these drums will be temporarily stored there in a surface building, - the underground capacity (first 2 chambers) of the final repository will be available in 2012. 	
Q.No 70	Article Article 32	Ref. in National Report D.2.4
Question/ Comment	<p>What technology for treatment of organic oils is proposed by the NPP? How are organic oils characterized and how are they stored?</p>	
Answer	<p>The oils are filtered by diatomaceous earth. After filtering the liquid phase can be released. The solid sludge is placed into drums. Up to now only 4 drums with oil sludge have been produced which are stored on-site.</p>	

Q.No 71	Article Article 32	Ref. in National Report Page 25
Question/ Comment	The Hungarian Third National Report states that only those facilities are classified as nuclear facilities in which the amount of nuclear material used in the facility is above a certain limit. What is the limit?	
Answer	<p>Nuclear facilities are those facilities – among others – where nuclear material in amounts greater than one effective kilogram is customarily used.</p> <p>The effective kilogram is a unit of the amount of nuclear material, depending on its weight and enrichment (see verification agreements concluded between the International Atomic Energy Agency and its Member States and the European Atomic Energy Community in connection with the Treaty on the Non-proliferation of Nuclear Weapons).</p>	
Q.No 72	Article Article 32	Ref. in National Report page 11
Question/ Comment	It is stated that in-situ investigation was carried out at the site of Mecsek hill in the area of Boda Claystone Formation for disposal of HLW and spent fuel during 1996-98 In addition another study was issued in 2001. Did you, at this stage, already have a kind of preliminary public hearing with local community? If yes, what was the response? If not, when is it foreseen to happen in recent future according to this program?	
Answer	<p>Environmental impact assessment for radioactive waste storage or repository and consultation of the public on site selection are linked together in Hungary. There are two acts which have both elements: Act CXVI of 1996 on Atomic Energy and Act LIII of 1995 on the General Rules of Environmental Protection. According to the Act on Atomic Energy provisions set forth in special legislation shall apply with respect to public hearings on the use of atomic energy.</p> <p>Act LIII on the General Rules of Environmental Protection stipulates that the impact assessment shall consist of a scoping (preparatory) and – in case it is necessary in accordance with the rules of the Act – a detailed assessment phase. The applicant shall present the findings of the phases of impact assessment in a preliminary environmental report and in a detailed environmental impact report.</p> <p>There are two opportunities for public participation within the licensing procedure. The first opportunity presents itself when the developer submits an application to the competent authority. The application and the preliminary report have to be made accessible for public. Citizens and groups that may be affected by the project are entitled to comment on the preliminary environmental report. Comments can be submitted in written form.</p> <p>Before making decision, the Environmental Authority (Inspectorate) takes into account the comments substantial from the viewpoint of consideration of impacts on environment.</p> <p>The second stage for public input is given in form of public hearing when the detailed environmental impact assessment study has been</p>	

	<p>performed. Act on the General Rules of Environmental Protection covers the general rules of these public hearings. After a detailed environmental impact report has been submitted to it, the Inspectorate shall hold a public hearing. Before making its decision, the Inspectorate studies the comments important in the matter from the aspect of evaluating the impact on the environment on their merits. In case there are several affected local governments, or if it is justified in view of the number of affected parties, separate public hearings may be held at several locations. Because of the above mentioned, official public hearing was held neither in 1998, nor later since no licensing procedure was initiated. Public outreach program, however, started as early as 1996. Since that public meetings are held regularly. Road shows are organized every year where the implementer pays visits the municipalities in the vicinity of the research area, providing information and establishing personal contacts. Also, opinion polls are organized regularly.</p>	
Q.No 73	Article Article 32	Ref. in National Report page 12
Question/ Comment	<p>It is stated that as a preparation for the disposal of the high level waste an underground research laboratory should be built. Have you already some timelines for building mentioned laboratory and the disposal itself.</p>	
Answer	<p>Based on the current plan, as laid down in the 8th Medium- and Long term Plan, in 2047 a HLW repository will be in operation in Hungary. The detailed schedule is as follows:</p> <p>2009 – 2019: Preparatory activities for siting an URL 2020– 2040: Construction of the research laboratory.</p> <ul style="list-style-type: none"> - Accomplishment of the research/exploration program and preparation of the investment. - Preparation of the quality assurance plans. <p>2040 – 2046: Construction of the repository for the high level radioactive wastes. 2047 – 2069: First phase of operation of the repository for the high level radioactive wastes.</p> <ul style="list-style-type: none"> - Transfer of the spent fuel assemblies stored in the Interim Spent Fuel Storage Facility to the repository. <p>2070 – 2094: Operation of the high level radioactive waste repository, waiting for transfer of the decommissioning wastes. 2093 – 2094: Expansion of the capacity of the high level radioactive waste repository for receipt of the decommissioning wastes. 2095 – 2104: Second phase of operation of the repository for the high level radioactive wastes.</p> <ul style="list-style-type: none"> - Transfer and deposition to the repositories of the decommissioning wastes of Paks Nuclear Power Plant. <p>2105 – 2108: Closure of the repository for the high level radioactive wastes. From 2108: Long term control.</p> <p>This schedule is the basis to calculate the contribution of the Paks NPP to the Central Nuclear Financial Fund. In the past few years, however, the project has been slowed down due to budgetary constraints and the priority given to the LILW disposal programme in Bataapati. In 2008, only the monitoring activities could be maintained. Besides the elaboration of a future decision on the fuel cycle back-end, the whole HLW programme needs to be reconsidered which remains the most dominant challenge for the next years.</p>	

Q.No 74	Article Article 32	Ref. in National Report page 15
Question/ Comment	According to your report, a construction of geological disposal for LILW at the Bataapati site started in mid 2008. Is this repository finished at this moment and are the first amounts of solid LILW from transferred here from the Paks NPP?	
Answer	<p>Commissioning of the repository is accomplished in two steps. In the first step only the surface facilities have been put into operation. The operational licence for the above-surface facilities of the repository was issued in September 2008. The interim storage of the waste shipped from Paks NPP is being realized in the technology building. By taking over of 3000 drums of solid waste the problem caused the fact that the storage capacity at NPP has run short will be solved. The shipments from Paks NPP started at the end of 2008.</p> <p>Until 2010 two underground disposal galleries are planned to be commissioned. After finishing the second step of the underground facilities the repository will consist of 17 disposal galleries which will be enough to accommodate the waste generating during the originally planned life time of the NPP.</p>	
Q.No 75	Article Article 32	Ref. in National Report
Question/ Comment	Was the national radioactive waste and spent fuel management policy officially adopted by the Hungarian government?	
Answer	<p>The Hungarian national radioactive waste policy is not discussed in a single document.</p> <ul style="list-style-type: none"> i) Act on atomic energy: The basic principles and the allocation of tasks and responsibilities among the players (government, ministers, authorities, licensees, etc.) in the field of radioactive waste management are laid down in Act CXVI of 1996 on atomic energy, where radioactive waste disposal (including waste from decommissioning, too) and spent fuel disposal & storage are declared as Government's responsibilities. The Central Nuclear Financial Fund (the Fund) was established by Act in order to finance the present and future costs associated with these activities. The main contributor to the Fund is the Paks NPP. Act does not deal with concrete waste management programmes in detail. ii) Medium and long term plans: The detailed and updated national radioactive waste management programme can be found in the medium and long term plan. The plan is prepared and revised by PURAM year by year and is approved by the Minister having jurisdiction over the Fund. The medium and long term plan sets out: <ul style="list-style-type: none"> i. strategy, ii. main features of the planned projects (the Radioactive Waste Treatment and Disposal Facility in Püspökszilágy, the National Radioactive Waste Repository in Bataapáti, the Interim Spent Fuel Storage Facility, the high level waste programme and the decommissioning of nuclear facilities), 	

	<ul style="list-style-type: none"> iii. time schedules (till the endpoints), harmonization between projects, iv. waste inventories and data, waste treatment practices, v. cost estimates for each project till the endpoints, the annual payments necessary during the Paks NPP's life-time to cover all the costs associated to the projects, vi. data of the next fiscal year budget of the fund. <p>iii) The specific investment plans and/or research programmes linked with the projects (earlier identified in the medium and long term plan) over several years period are also prepared and to be approved by the Minister. These technical plans are expected to be always in harmony with the medium and long term plans and they are updated if necessary.</p> <p>iv) Based on the calculations of the medium and long term plan approved by the minister, the proposal for the fund budget of next fiscal year is built into the act on the state budget itself (it becomes a chapter of the act) which has to be approved by Parliament. After the Parliament's approval of the budget the PURAM prepares its annual programme of work.</p>	
Q.No 76	Article Article 32	Ref. in National Report
Question/ Comment	Can you explain for what aims your categorization of radioactive waste is used?	
Answer	The aim at the categorization of radioactive waste is that all relevant radioisotopes used in atomic energy are to be taken into account, and the derivation of categories can be readily performed, namely, activity concentrations in proportion to exemption activity concentrations are considered.	
Q.No 77	Article Article 32	Ref. in National Report
Question/ Comment	What method will you prefer for conditioning of spent resins?	
Answer	Cementation is the preferred option. A special cementation recipe has been developed for resins.	
Q.No 78	Article Article 32	Ref. in National Report B.1.1
Question/ Comment	p. 11”The investigations have been supported by the adjacent nine municipalities.” Please clarify how the municipalities have supported the investigations.	

Answer	<p>Some evidences of the public support:</p> <p><i>Allow investigations</i> During the earlier investigations carried out between 1995 and 1998 at the region municipality of Boda expressed interest in collaborating with the program organizers (at that time with Paks NPP). In the current program the municipality agrees with the implementer's (PURAM) program on the site selection, the first step of which is identification a site for underground research laboratory.</p> <p><i>Help the implementer to disseminate information</i> As of 1996 a group was created (West Mecsek Public Information Association or NyMTIT) allowing the implementer (PURAM) to channel incentives and information. Today comprising 9 settlements located in the investigation area for the HLW repository and serving a total of 7,500 persons. The main task of the NyMTIT is familiarizing the public with the underground exploration and research programme.</p> <p><i>Transmit local concerns</i> The Association is effectively in touch with and can transmit local concerns. For instance, contractual arrangements for communication, co-ordination, and organisation work were concluded between NyMTIT and two local civil society organisations (Zsongorkó Friends and the Zöld Völgy minor-region association). The dialogue with the public is much more direct with the involvement of these stakeholder organisations. Major of Boda calls such arrangements “the most important component of establishing and maintaining the communication relationships”, since messages can quickly be transferred to the concerned group of population through these relays and with the help of the media. The feedback to NyMTIT then “can only be direct, quick and authentic”. This feedback is used to fine-tune public opinion polls by which NyMTIT gathers views among the broader population.</p> <p><i>Proactive in understanding the scientific results</i> NyMTIT signed an agreement with MTA (Hungarian Academy of Sciences) to provide for the co-operation of three well-known scientists in communication to the public; they translated the research documents and data written in professional jargon into a more understandable form. These scientists take part in and give presentations in public forums and review professional documents submitted to the Association.</p> <p><i>Lobbying</i> The NyMTIT gained access in 2006 to the lobby group of the Parliament of the Republic of Hungary. The Association can study and comment on new legal regulations before they are debated, and explain local positions to national politicians.</p>	
Q.No 79	Article Article 32	Ref. in National Report B.1.2
Question/ Comment	p. 13”...difference in fuel characteristics would cause legal and technical problems.” Please clarify what the legal problems would be.	

Answer	In the course of the licensing procedure of the Interim Spent Fuel Storage Facility, the building authority competent for the area enforced aspects relating to landscaping and general architectural requirements. Under the pressure of the population the occupancy license (license for use/taking into operation a building) storage of spent fuel elements generated in installations other than the Paks NPP is strictly prohibited. From the technical point of view the current design layout of the facility is not suitable for the storage of spent fuels originated from research reactors (a significant modification of the storage tubes and, consequently, the Final Safety Analysis Report would be necessary).									
Q.No 80	Article Article 32	Ref. in National Report D.2.1								
Question/ Comment	p. 20 Have you limits for the concentration of long-lived nuclides and beta-emitters in LILW-SL?									
Answer	There are no special limits (concentrations) for long-lived nuclides and beta emitters in LILW-SL, but in the case of disposal the operator of the repository limits the concentration of these nuclides in the waste acceptance criteria.									
Q.No 81	Article Article 32	Ref. in National Report D.2.1								
Question/ Comment	p. 20 Can you provide an example of more detailed classification for the low, intermediate and high level radioactive wastes?									
Answer	<p>The Hungarian Standard MSZ-14344-1:2004 contains the same classification as the relevant decree but recommends also a classification on the basis of dose rate*:</p> <table border="1" data-bbox="309 1058 1368 1353"> <thead> <tr> <th>Class of radioactive waste</th> <th>Surface dose rate (microSv/h)</th> </tr> </thead> <tbody> <tr> <td>Low level</td> <td>$<3 \times 10^2$</td> </tr> <tr> <td>Intermediate level</td> <td>$3 \times 10^2 - 1 \times 10^4$</td> </tr> <tr> <td>High level</td> <td>$>1 \times 10^4$</td> </tr> </tbody> </table> <p>*in the case of nuclear reactors and accelerators, alpha emitter and transuranic nuclides are excluded</p>		Class of radioactive waste	Surface dose rate (microSv/h)	Low level	$<3 \times 10^2$	Intermediate level	$3 \times 10^2 - 1 \times 10^4$	High level	$>1 \times 10^4$
Class of radioactive waste	Surface dose rate (microSv/h)									
Low level	$<3 \times 10^2$									
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High level	$>1 \times 10^4$									

Q.No 82	Article Article 32	Ref. in National Report D.2.4
Question/ Comment	It is mentioned in page 23 in the last paragraph of the section concerning liquid radioactive waste that liquid waste treatment system is expected to start in 2009. Could you provide a brief description of the treatment system?	
Answer	<p>The original Fortum treatment system (which was not suitable for our waste due to its high detergent content) has been modified. The new technological sequence is the following:</p> <ul style="list-style-type: none"> - Underwater plasma technology which is a new type of “incineration” method for liquid wastes that contain organic components. The decomposition of the organic materials takes place in an electric plasma zone generated directly in the diluted aqueous solutions. In the course of the decomposition of organic materials mostly carbon dioxide, nitrogen and water are formed, while the inorganic salt content of the solution remains unchanged. Liquid containing halide, sulphur and phosphorus can be processed as well. - Ultra filtration - Cs removal filtering - Crystallization and filtering (by Larox system) 	
Q.No 83	Article Article 32	Ref. in National Report p. 11; B.1.1
Question/ Comment	By the end of 2007, more than 7,000 spent fuel assemblies have been stored in both the wet storage ponds and the Interim Spent Fuel Storage Facility (ISFSF) at the Paks site. This quantity will grow considerably in the coming decades if the intended life-time extension of the Paks NPP is implemented. Are there already plans for the disposal of spent fuel because storage time in the ISFSF is limited to 50 years?	
Answer	<p>With respect to the disposal of high level waste and spent nuclear fuel, the policies and practices followed by Hungary are described in Section B of the National Report. As mentioned there, it is a strategic target that preparations should be made to construct a waste repository for the disposal of the country’s high level radioactive wastes in a deep, geological formation to provide long-term isolation. In accordance with international viewpoints, such a repository can be used for the direct disposal of spent nuclear fuels and would also be suitable for the reception of wastes from fuel reprocessing. No decision has yet been taken on the back-end of the fuel cycle. Thanks to the existence of the Interim Spent Fuel Storage Facility, there is sufficient time to elaborate the national policy and strategy.</p>	
Q.No 84	Article Article 32	Ref. in National Report Section C. Scope of application, Page 17
Question/ Comment	The report states that “any waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle is not radioactive waste from the viewpoint of the Convention”. Could Hungary explain the basis for not including NORM waste in	

	their national radioactive waste management system?	
Answer	Article 3 (2) of the Convention reads: „This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.” In line with this statement the Hungarian National Report excludes from its scope any waste that contains only naturally occurring radioactive material and does not originate from the nuclear fuel cycle. The scope of the Ministerial Decree 47/2003. (VIII. 8.) of the Minister for health – the main regulation for radioactive waste management – includes certain radiation protection issues of naturally occurring radioactive materials concentrating during industrial activity (TENORM) but NORM waste is excluded from the national radioactive waste management system. The Decree 16/2000. (VI. 8.) issued by the Minister for health is dealing with the radiation protection issues of naturally occurring radioactive sources.	
Q.No 85	Article Article 32	Ref. in National Report D.2.1, p. 21
Question/ Comment	The dose constrain (annual individual dose to individuals) established in relation to clearance of material contained or contaminated by radionuclides (30 mSv/y) exceeds the relevant effective dose to individuals recommended by the IAEA and CEC regulations (10 mSv/y).	
Answer	According to the Safety Series No. 115 and EU Directive 96/29 Euratom, the exemption (clearance) value is of the order of 10 microSv/y, hereby 30 microSv/y is included in this range.	
Q.No 86	Article Article 32	Ref. in National Report B1.1, p.12
Question/ Comment	Have other options been assessed (canister, centralized storage in one building)? What is the motivation for the choice of constructing SNF storage facilities as separate modules? Have there been any evaluation of integral long-term expenses for module and canister, and what are these expenses?	
Answer	For establishment of an interim storage facility for spent nuclear fuel in 1991 an international tender was launched. The safety was the most important evaluating aspect, and only those companies were accepted for the competition whose storage facilities were licensed by internationally renowned regulatory bodies. Various types of wet and dry storage facilities were under consideration during the selection of the storage type. Offered storage types included: <ul style="list-style-type: none"> - cast iron container (dual-purpose), - lead container (dual-purpose), 	

	<ul style="list-style-type: none"> - concrete container (single-purpose) - canister, - vault dry store, - wet store. <p>Some ten criteria were selected against which the evaluation was carried out. Criteria included aspects such as applicability of the technology to the existing conditions, demand of space, operability, radiation protection, operational cost, time required for implementation, etc. After a very comprehensive evaluation process – with the participation of international experts as well – the Modular Vault Dry Storage type was selected. Dry storage was judged more favourable for the longer term because of its inherent passive nature and low operating costs.</p>	
Q.No 87	Article Article 32	Ref. in National Report D2.1, p.20
Question/ Comment	Is there any consideration of a need to introduce a category for very low level waste?	
Answer	Presently, there is no need to set up a category for very low level waste, it may be later the case, when the decommissioning of Paks NPP will start.	
Q.No 88	Article Article 32	Ref. in National Report pages 14, 22
Question/ Comment	Do you have any experience with crystallisation of liquid radioactive waste (concentrates) during its long term storage in NPP operational tanks? What are your lessons learned? What are your preventive and corrective measures?	
Answer	<p>Large amount of borax crystals were formed in one tank as the temperature of its content decreased. The liquid phase was removed to another tank while the crystals were diluted in warm water then reconcentrated by evaporator.</p> <p>Lesson learned: it is important to take care of adjusting concentration and temperature.</p> <p>Corrective measure: simple sample taking and laboratory measurement of borax concentration.</p>	
Q.No 89	Article Article 32	Ref. in National Report Section B,1,2, Page 13
Question/ Comment	The report indicates that some spent fuel may be shipped to Russia in the future. Will this new agreement require Hungary to take back the wastes generated during re-processing, as this was the reason the previous agreement was terminated?	

Answer	The Agreement between the Government of the Russian Federation and the Government of the Republic of Hungary on cooperation in transportation of irradiated nuclear fuel of the research reactor into the Russian Federation does not require Hungary to take back the waste generated during re-processing.	
Q.No 90	Article Article 32	Ref. in National Report Section B.1.1, Page 11
Question/ Comment	Hungary has achieved significant success in siting and construction of a geologic repository for low- and intermediate-level waste which has been approved by a local referendum. A planned repository for high-level waste and spent fuel also has strong public support, including from the nine adjacent municipalities. Please provide highlights of Hungary's public participation process and how it has been implemented for these two projects during your national presentation in May 2009. What are key lessons learned which may be useful to other Contracting Parties?	
Answer	<p><i>SOME LESSONS LEARNT</i></p> <p><i>Influence of the local people on the national nuclear waste management framework</i> The involvement of local people should begin as early as a national policy is being discussed even before the site selection process starts. Since nuclear waste management is a national issue looking for a local solution, cooperation is most requested between the different levels of governance. National and local players must work together to take a shared responsibility for their waste.</p> <p><i>Site selection process</i> A preliminary discussion on site selection criteria — both at national and local level — should make clear how economic and political factors are included in the decision beside safety.</p> <p><i>Local democracy</i> To improve the governance of nuclear waste management includes the empowerment of local involved people and an active participation of the wider population. A local partnership embodied by a local organisation, involving the various categories of the community representatives and other local concerned actors is expected to play a major role in gathering and disseminating information, interacting with the available sources of expertise, dialoguing and informing the regional and national levels.</p> <p><i>Information and transparency</i> The public should be continuously kept informed of the work that is carried out. In the LILW program settlement mayors carry home information from regular association meetings. A regional monthly is delivered to 15 settlements and a monthly TV program (entitled Regional News) is broadcast by the seven member settlements through their cable TV networks. As well, many citizens of the settlements worked in the exploration programme which was the area's second largest public works contract. These citizens know exactly what kind of</p>	

activity is conducted and so, it would be impossible in such a context for anything “secret” to be kept apart. There is confidence among the actors in the safety of the repository undertaking and in their ability to solve problems together.

As far as the HLW program, the Social Association maintains a public information office where all documentary materials can be found. Meetings are held in each settlement, and a road show lasting one month visited eleven locations, providing information and establishing personal contacts. “Information parks” have been constructed; historic information is displayed on panels placed alongside walking paths. Schools visits to sites are organised in order to familiarise future decision makers with waste management activities. A quarterly newspaper, the West Mecsek Compass, is issued to each household free of charge. Each town has its own monthly publication, reporting local news and developments from schools or institutions, along with the agenda of scientific and other meetings. This information is available on-line. A cable TV network serves all these settlements, allowing real-time monitoring of the investigation sites. Because civil society needs information from reliable experts to participate in waste management, the association contacted the Hungarian Academy of Sciences to provide input, including translation of the technical issues into everyday language and double-checking of environmental measurements.

Financial incentives

It is essential, that the attitude that radioactive waste disposal is merely a technical problem to be solved by experts, must be abandoned. A repository has social and economic dimensions that will seriously affect the quality of life in the adjacent communities. It has the potential to stigmatise communities, making them less attractive to residents, businesses, visitors etc.

The need to lay out a clear package of benefits, both social and financial, at a similarly early stage, in addition to early guarantees of good faith and commitment. These are of course what are referred to as ‘volunteer incentives’. It is generally thought to be essential that volunteer and potential-volunteer communities are as fully aware of the possibilities at as early stage as possible. Indeed, it is considered by many people that these could, and should, merely be opening offers, and that benefits should be adapted to suit the particular local situation. Naturally financial incentives are not the answer in every situation. Any agreements as regards incentives, whether financial or otherwise, must be entered into in good faith by all parties. This of course then depends on the issue of mutual trust already discussed.

Regional development policy

It seems actually difficult to site a nuclear facility without considering the positive and negative impact it will have for the concerned territory. The integration and development of the site within a regional development policy which encompasses a prospective view on the future of the area is seen as a key factor to improve the governance of nuclear waste management in the short as well as in the longer term.