Convention on Nuclear Safety

Questions Posted To Hungary in 2017

No.	Country	Article	Ref. in National Report	Question	Answer	Support Documents
1	Austria	General	Annex 7, p151	Which changes and new procedures will be introduced in SAMG to cover for a simultaneous accident at reactors and SFPs?	The modification of the SAMG was prescribed by the results of the stress tests (Targeted Safety Reassessment) and it is not finished yet. The deadline is 2018. „Simultaneous accident at reactors and SFPs" tasks are managed by the Paks NPP Emergency Response Organization (ERO). SAM activities as all emergency management tasks are controlled by the Technical Support Centre working in the frame of ERO. SAM strategies consider actions to be performed in case of accidents initiated during the major possible plant states like full power operation, plant shut-down state with open containment and accidents related to the spent fuel pool inside the reactor building. The implementation of a general safety improvement plan is conducted in two phases, until 2015 and until 2018. The safety improvement actions decided upon the Targeted Safety Reassessment makes the management of severe accidents affecting more units (or spent fuel pools) at the same time possible. The most important actions are as follows: a) purchase of high power accident diesel generators protected against beyond design basis external hazards; b) implementation of containment overpressure protection occurring during severe accident; c) construction of alternate cooling of the spent fuel pools; d) construction of a Protected Command Centre and a Backup Command Centre protected against beyond design basis external hazards; e) construction of alternate water supply possibilities by taking into account all coolant resources nearby the site (bank filtered wells, fishing lakes, water discharge (hot water canal, tanker truck supply); f) improvement of reliability of electric power supply from an external network; g) development of a severe accident simulator.	

2	Canada	General	p.16 section 3.10	The Hungarian Atomic Energy Authority (HAEA) increased its human resources significantly in 2015. The 2015 IRRS review team suggested that HAEA “Develop a procedure to inspect and evaluate safety culture, and as necessary, management systems”. With the increased capacity of the regulator, has this been achieved? Have any safety culture assessments been undertaken? What are the future plans in this area?	A procedure has been developed and entered into force in 2016 for "Assessment and evaluation of the HAEA's safety culture". Based on this procedure, safety culture assessment has not yet been undertaken so far. HAEA intends to carry out its safety cultrure assessment during 2017.	
3	Germany	General	General	How do you define “a new nuclear power plant”? For example: do you consider a power plant to cease	Annex 10 of Govt. Decree 118/2011 (VII. 11). has the following definition: "161. New nuclear power plant unit: A nuclear power plant unit constructed after 1 April 2012."	

				being a “new nuclear power plant” once operation begins?		
4	Germany	General	General	How does your national requirements and regulations incorporate appropriate technical criteria and standards to address the objective of preventing accidents in the commissioning and operation of new nuclear power plants? For example: can you describe the basic design objectives and the measures you have in place to ensure the robustness and independence of defense in depth measures? Consider for instance inclusion of implementation of Regulatory requirements for: Robustness of DiD and independency of the levels of DiD,	The detailed nuclear safety requirements are included in the Govt. Decree 118/2011 (VII.11.). Specifically the design requirements can be found in its Annex (Volume) 3a. It is available via internet: http://www.oah.hu/web/v3/HAEAportal.nsf/web?openagent&menu=03&submenu=3_1 The following sections are covering the required issues: - DiD: Section 7 of Govt. Decree 118/2011 (VII.11.), independence is covered in Section 7 (4a) - DiD detailed requirements: from Section 3a.2.1.1400 - DEC: definitions cover DEC in Volume 10, Section 163, while DEC requirements are from 3a.2.2.6000. - preventing high pressure core melt: 3a.2.2.7400. - core melt frequency limit is specified in 3a.2.4.0600. - CCF is addressed in 3a.3.1.1000., 3a.4.5.0400., 3a.4.5.2100., 3a.4.5.4700 - analysis of external events: from 3a.3.6.2800. The 3a requirements are relevant for new units. In terms of operating units the same requirements can be found in Annex 3 of the decree.	

				Design Extension Conditions (DEC), practical elimination of high pressure core melt scenarios, achieving a very low core melt frequency, protecting digital safety equipment against Common Cause Failure (CCF), External events analysis.		
5	Germany	General	General	How do your national requirements and regulations incorporate appropriate technical criteria and standards to address the objective of mitigating against possible releases of radionuclides causing long-term offsite contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term	The Govt. Decree 118/2011 (VII. 11.) on the nuclear safety requirements of nuclear facilities and on related regulatory activities, and its annexes on Nuclear Safety Codes for design and operation of nuclear power plants contain the safety requirements for nuclear systems, structures and components. These requirements concern all systems, structures and components applied to hinder, contain or limit radioactive discharges during both normal operation and emergency. The Nuclear Safety Codes are regularly revised by HAEA, taking into account the IAEA, WENRA and HERCA recommendations. The Nuclear Safety Codes and Radiation Safety Code [Govt. Decree 487/2015 (XII.30) on the protection against ionization radiation] specify the general (dose) limits for the protection of emergency workers. The details of the protection of a facility's emergency workers are included in the emergency response plan of the nuclear facility which – according to the Govt. Decree 118/2011 (VII. 11.) – must be approved by HAEA. Regarding the national emergency response organization, the protection of their emergency workers is included in the National Emergency Response Plan.	

				protective measures and actions? For example: can you describe the measures you have in place to protect against severe accidents and your accident management arrangements - how do you protect staff during accident management? Consider for instance inclusion of implementation of Regulatory requirements for: Engineered systems to protect the containment, engineered systems to cool the molten core, severe accident management, protection of staff during the accident, Provision and resilience of Emergency Mitigation Equipment (EME).		

6	Germany	General	General	How do your national requirements and regulations address the application of the principles and safety objectives of the Vienna Declaration to existing NPPs?	The detailed nuclear safety requirements are included into the Govt. Decree 118/2011 (VII.11.). The Govt. Decree 118/2011 (VII.11.) is relevant for both existing and new nuclear installations. Design requirements for existing NPPs can be found in its Annex (Volume) 3. It is available via internet: http://www.oah.hu/web/v3/HAEAportal.nsf/web?openagent&menu=03&submenu=3_1 The requirements for existing units related to the Items of the Vienna Declaration are as follows: 1. Govt. Decree 118/2011 (VII.11.), Section 6 (4) and Section 6 (6) 2. Govt. Decree 118/2011 (VII.11.), Section 34 3. Govt. Decree 118/2011 (VII.11.), Section 3 (7).	
7	Germany	General	General	Do your national requirements and regulatory framework require the performance of periodic comprehensive and systematic safety assessments of existing NPPs – if so, against what criteria/benchmarks are these assessments completed and how do you ensure the findings of such assessments are implemented?	Periodic Safety Reviews of the nuclear facility are performed by the nuclear safety authority every ten years. The purpose of the Periodic Safety Review is to examine whether the operation of the nuclear facility is in compliance with the basis of licensing (i.e. it shall be demonstrated that all nuclear safety requirements and licensing conditions are complied with). The nuclear safety authority shall close the Periodic Safety Review in a resolution, which may impose obligations (safety improvement actions) on the licensee.	
8	Germany	General	General	Do your national requirements and regulations require	As a result of the Periodic Safety Review a program of safety improvement actions shall be submitted to the auhtority. According to the requirements the licensee shall take all corrective actions resulting from the review, which are reasonably achievable	

				reasonably practicable/achievable safety improvements to be implemented in a timely manner – if so, against what risk/engineering objective or limit are these judged and can you give practical examples?	and which are significant from nuclear safety point of view, within the shortest possible time. When the deadlines for implementation are set, the significance of the corrective actions from the point of view safety shall also be taken into account.	
9	Germany	General	General	How do your national requirements and regulations take into account the relevant IAEA Safety Standards throughout the life-time of a Nuclear Power Plant?	According to the law the nuclear safety requirements shall be reviewed and updated at least every five years according to new science results and domestic and international experiences. If the implementation of the new IAEA Safety Standards are urgent, an extraordinary review can be inititated. For example, this happened after the Fukushima accident.	
10	Germany	General	General	What issues have you faced or expect to face in applying the Vienna Declaration principles and objectives to your existing fleet or new build of Nuclear Power Plants?	All principles of the Declaration are already covered in the Hungarian regulations (see answer to Q6). For existing units, the periodic safety review system has been implemented into the Hungarian nuclear safety regulation. The next periodic safety review will take place in 2018. Reconfirmation of compliance with these requirements will be carried out during the review. Regarding the new units, we do not expect issues with fulfilling the principles of the Vienna Declaration, because the units can be designed according to the legally binding nuclear safety requirements. The HAEA developed a comprehensive set of regulatory guidelines to aid the licensee’s effort to understand and implement those requirements.	
11	Greece	General	p.11	Could you please provide, any results	The new operating cycle has several benefits for MVM Paks NPP. In 2016, Unit 3 was operated continuously without outage, every operational parameter was appropriate	

				already obtained following the application of the new cycle in Paks NPP?	and corresponded with the previously calculated values. In 2016, electricity generation of MVM Paks NPP was 16.054 TWh, a record value since the start of the operation and exceeding the 2015 value by 1.4%. In 2016 Paks NPP achieved a load factor record (91.4%) as well. The new operating cycle caused a record low rate of human collective dose in 2016, which was by 24% less than the best value until now. The volume of low- and medium-level radioactive waste has also decreased due to less maintanence activities. In 2016, the total number of barrels containing waste was 723 with a total of 161 m3 of liquid waste. These values are ~20% lower than in the previous years. The amount of spent fuel replaced also changed favorably: in 2015 it was 395, in 2016 it decreased to 297.	
12	Greece	General	p.15, p.103	Hungary completed an IRRS mission in May 2015 and OSART and WANO missions in 2014. The Summary Report of the 6th Review Meeting called upon the Contracting Parties to report on the findings from peer review mission and the progress made in implementing the associated action plans in response to these findings. In the report of Hungary, some general information about the	The most important findings of the IRRS mission were related to the following: - Independence of the HAEA in terms of decision on its organization and spending of approved budget - More effective coordination between authorities regarding their responsibilities - During the handover of authority responsibilities it has to be ensured that the new competent authority takes over all of the tasks related to the new responsibility. - Authorities need long term human resource plans. - Establishment of a management system in compliance with IAEA requirements (for the environmental authority) - Authority documents (inspection plan, licensing procedure) should apply Graded Approach more clearly - Enforcement policy and procedures should be revised and developed - Effectiveness of the issuing of regulatory guides should be enhanced. All the findings were implemented to the action plan of the HAEA and regular coordination meetings with the representatives of the government and other concerned authorities (environmental, health) are organized to fully implement the suggestions and recommendations. Main conclusions of WANO follow-up peer review in 2014: The World Association of Nuclear Operators-Moscow Centre (WANO-MC) conducted a follow-up Peer Review of MVM PAKS Nuclear Power Plant during a week in	

				missions is provided. Can you please provide more details, in particular regarding important findings and the actions addressing them?	February 2014. The review focused on determining the effectiveness of corrective actions taken in response to the 18 areas for improvement (AFI) identified in the February 2012 Peer Review. The current AFI status has been evaluated using a scale with assessment levels from A-D. Six of the AFIs received level A ranking (Satisfactory level - Evidence shows substantial performance improvement has been achieved) and 12 AFIs were evaluated as level B ranking (On Track level - Evidence shows that performance has begun to improve but some performance gaps remain) MVM Paks NPP has continued his effort to further improve the B level AFIs. Main conclusions of the IAEA OSART mission in 2014: The OSART team concluded that the managers of Paks NPP are committed to improving the operational safety and reliability of their plant. The team found good areas of performance, including the following: * The plant has a comprehensive radiation protection monitoring system which consists of a Release and Environmental Monitoring Subsystem, a Meteorological tower and a Dosimetry Control Room with video-graphic panel display. * The new Slab/block Lifting equipment for hermetic slab/block covering in the reactor hall reduces the risks of personal injury and equipment failure due to dropping. * The plant has developed a mobile DC power supply that can be used in the event of failure of a plant safety battery or potentially in case of a severe accident. A number of proposals for improvements in operational safety were offered by the team. The most significant proposals include the following: * The plant management system does not allow having an integrated view of all aspects related to safety, encompassing plant staff and contractors. * Plant personnel do not always feel accountable and responsible for reporting deficiencies of systems and components which are not in their direct technical area. In some cases observed, the threshold for identifying and reporting deficiencies was not low enough. * In the work control process, the planning and prioritization arrangements are not based on a graded approach to safety. * The plant operating experience program regarding screening, use of operating experience and effectiveness reviews, is not effectively implemented.	

					Elaboration of the OSART mission results: The 23 issues (15 recommendations and 8 suggestions) identified by the review team were assessed with the pilot usage of WANO „stream" analysis methodology. Based on senior management team involvement and the safety priority principle, 58 high priority „Driver" issues were identified. Based on these issues, a comprehensive corrective action plan was elaborated. The progress monitoring of the fulfillment of the actions was performed quarterly on the Operational Review Committee meeting. Status reports were submitted quarterly to the top management team.	
13	Greece	General	p.23	Can you specify where the "electromagnetic effects" come from?	Electromagnetic effects were identified in the stress test as an external hazard (it is part of the regulations in Hungary). During the stress test HAEA required that a "list of such system components important to safety, which are endangered by electromagnetic effects (including the effects induced by lightning) and thereby need to be classified accordingly, shall be compiled to display whether or not a given component is adequately qualified". Based on the list, the authority and the licensee could specify reinforcements and corrective actions. This resulted in the supplementary repair of external lightning protection systems. Modification of cable paths and shielding of relay tables and I&C cabinets have been commenced.	
14	Greece	General	p.22	As provided in the report TSR actions include "Establishing and developing electric connections between the units". Could you please explain more?	The reliability of the backup supply system is increased by the connections between the units with the use of series sectionalizing switches. In severe accident conditions this lengthwise interconnection and crosswise coupling of bus bars provides an alternative route to any safety power supply system from any operating diesel generator. This alternative power supply can only be used during beyond design basis accidents as follows: one diesel generator supplies one safety power supply system.	
15	India	General	Section 3.2, Page 11	The report states "The planned introduction of the 15-month	Experts of the MVM Paks NPP conducted a detailed investigation to determine the appropriate reload design details, including fuel pin enrichment and burnable poison enrichment distribution. The new fuel has an average enrichment of 4.7wt%, 0.5wt%	

				operation cycle and the application of the modified nuclear fuel made necessary the amendment to the environmental protection license of the nuclear power plant. The HAEA, at the request of the South-Trans-Danubian Environmental and Nature Protection Inspectorate, issued a co-authority opinion in September, 2014 in this proceeding. The environmental protection authority granted a new environmental protection license to the operation of the nuclear power plant." With regard to operation with higher enriched fuel to introduce 15 month operation cycles, what were the re-	more than the previous fuel, that was used in a 12-month cycle, meanwhile the amount of Gadolinium has been doubled. This provided that altogether the neutron flux has changed favorably and the extent of neutron embrittlement and the risk of the swelling of the reactor pressure vessel wall and the Reactor Pressure Vessel (RPV) internal components have decreased. Regarding the probabilistic safety assessment (PSA), the number of periods with high risk factor (e.g. functional tests, maintenance of safety systems/equipments) for the plant's total lifetime has also decreased. Therefore the value of core damage frequency (CDF) has changed favorably. Over the neutron embrittlement, swelling risk and the source term change, MVM Paks NPP has recalculated all the time-limited-ageing-analyses according to the iGall (IAEA international generic ageing lessons learned) methodology. Due to longer operating cycles, the number of transients for the plant's total lifetime has been reduced, which caused favorable changes in the strength analyses, the fatigue calculations, the reactor pressure vessel pressurized thermal shock analysis, the crack growth analyses and the high energy line break analyses. The accident source term has been recalculated, the core inventory has been changed. Paks NPP has reanalyzed the accidental isotope emissions and has taken it into account in dispersion calculations, using the PC COSYMA code. On the basis of the new analysis, the Hungarian environmental authority has granted the modified environmental license. According to the safety analyses, the longer operation cycle has altogether positive effects on the nuclear safety of the power plant.	

				analyses / submissions (If any) reviewed from regulatory point of view? (e.g.: neutron embrittlement, accident analysis source term).		
16	Lithuania	General	Page 11	It is stated in the Report that the licensee submitted its license application for the operation with the 15-month operation cycle in November, 2014. The HAEA granted the license, in its resolution issued on December 1, 2015, to introduce the 15-month operation cycle at Units 1-4 of the nuclear power plant. Could you please clarify the content of safety justification documents for such application.	The results of the safety, environmental and cost-effectiveness analyses of the new fuel type and prolonged fuel cycle were all positive. MVM Paks NPP has justified the validity of the lifetime extension's safety analyses, time-limited aging analyses and design bases, when using the new type of 4.7wt% enriched fuel and the extended 15-month operating cycle. Paks NPP has also justified the validity of nondestructive testing (NDT) inspection qualifications according to ENIQ (European Network for Inspection and Qualification) methodology. Given this justification, Paks NPP had to modifiy the in-service inspection, ageing management, maintenance, repair and replacement, in-service testing, maintenance effectiveness monitoring, operating procedures, and all surveillance programs and criteria. Lastly, Paks NPP modified the Final Safety Analysis Report as well.	
17	Lithuania	General	Page 15	It is stated in the Report that the PSIR aims at providing	Legal requirements for the design of new NPPs are stated in Annex 3a of Govt. Decree 118/2011 (VII. 11). Requirements covering the WENRA safety objectives for new NPPs are in that Annex:	

				sufficiently detailed preparatory information to the HAEA on the safety of the planned nuclear power plant. The PSIR submitted to the HAEA includes general design information, but it does not include the site specific design solution to be applied at the Hungarian new nuclear power plant units. Could you please explain how WENRA safety objectives for new NPP design are addressed in the national safety requirements, including design expectations concerning an intentional crash of a commercial aircraft?	http://www.oah.hu/web/v3/HAEAportal.nsf/web?openagent&menu=03&submenu=3_1 The expectations regarding commercial airplane crashes are the following: - A site specific hazard evaluation has to be performed, and any event resulting from external human activities (including an airplane crash) have to be considered as a postulated initiating event, if the frequency of occurrence is higher than 10E-7/year; - for aircraft crashes, that are exceeding the design basis, DEC A event acceptance criteria have to be met.	
18	Norway	General	page 159	About the professional committees of the	The professional committees are standing committees of the Parliament. The Parliament normally forms its system of standing committees at its constituent sitting and also decides which committees to operate along with committee names,	

				Parliament: How are they selected? Are there representatives from the nuclear power utilities?	number of members and officers. Standing committees are parliamentary bodies that initiate measures, express opinions and put forward proposals; make a final decision in cases set down in the law and in the provisions of the Rules of Procedure and participate in monitoring the work of the government. The members of standing commitees are MPs.	
19	Poland	General	Page 16	Could you provide more information on how is the independence of the TSO guaranteed?	As it is written on page 8 in the Hungarian National Report, in such cases, where independence is concerned, the HAEA requests a special declaration from the technical support organization to justify that the technical support organization does not work in the given topic for the licensee. The contracts between the regulatory body and the TSO partners contain requirements related to independence also but the above-mentioned separate declaration is needed to emphasize the importance and strengthen the level of independence.	
20	Poland	General	ANNEX 1	Do the HAEA inspectors are licensed to testing by NDT/NDE method?	No. The HAEA inspectors receive training in the NDT/NDE method, but their qualification is not a requirement. The testing is made by the NPP's organization, called the Material Testing Organization, which is accredited and holds personal licenses.	
21	Slovakia	General	Chapter 20, p. 106 and Annex 7, p. 127	The most important actions of the TSR that have not yet been completed are as follows: a) purchase of high power accident diesel generators protected against beyond design basis external hazards; and Annex 7 National Action Plan	The design basis level for external hazards is one order of magnitude lower the design basis of the plant for the high power emergency diesel generator and for the back-up command center. This means that 10E-5/y loads should be taken into account at high power emergency diesel generator and at the back-up command center. The safety class 3 will be applied like at other SA systems.	

				of Hungary on the Implementation Actions decided upon Lessons Learned from the Fukushima Daiichi Accident 3.1.2 Severe accident management hardware provisions What are the requirements for new facilities (e.g. mobile diesel generators or high power accident diesel generators, etc.) to prevent or mitigate consequences of SA concerning testing and maintenance and their inclusion into the safety classes?		
22	South Africa	General	general	The document should contain a list of Abbreviations / Acronyms	National reports vary whether they contain a list of abbreviations. Earlier Hungarian national reports did not have a list of abbreviations. The Hungarian Party – for easier understanding – will include a list of abbreviations in the next national report.	
23	Ukraine	General	pages 10 – 11, Sec. 3.2	Is it possible to provide additional information on the use of 15-month	The new fuel assembly (Gd-2_4.7) is a Hungarian innovation developed through international cooperation and based on the design of the Reactor Physics Department of Paks NPP. Paks NPP had to obtain the following licenses or amendments to the existing licenses:	

				operating cycle at Paks NPP: - what fuel type will be used? - how implementation of this cycle and mixed core were licensed? - what amendments to the license for environmental protection were introduced in connection with implementation of the new cycle and new fuel?	- License for fresh and spent fuel transportation containers; - License of the interim storage in the interim spent fuel storage facility; - License for testing (a 12-month test campaign with 12 new fuel assemblies); - License for the implementation of the prolonged, 15-month operating cycle; - Environmental license of the NPP (a public hearing was organized); Amendments to the environmental license covered the following: zone inventory, impact area, emission limits, parameters of the nuclear fuel: enrichment, burnout limits, etc.	
88	United States of America	General	General	Proposed Good practice: The use of a smartphone app to provide emergency alerts based on pre-set or real-time GPS locations	Hungary highly appreciates the use of the smartphone app as a proposed good practice.	
25	United States of America	General	Section 20, pg 106	Please provide an update on the status of implementation of recommendations from the post-	Annex 7 of the Hungarian CNS national report contains the progress of implementation. The national presentation will cover the progress since the closing date of the CNS National Report (31 December 2015).	

				Fukushima TSR (stress test).		
26	Austria	Article 6	Sections 6.1.2, 6.13, p20-22	In Section 6.1.3 Safety improvement measures (p22) it is stated that the next review is due in 2018. Will the scope of the Periodic Safety Review be reduced considering the recent life extension activities? Are the requirements of the most recent Nuclear Safety Code the criteria for the compliance with current standards within the PSR in 2018?	The Periodic Safety Review (PSR) and the lifetime extension of the operating units shall be managed separately. Accordingly, the scope of the PSR did not change. It is governed by the Govt. Decree 118/2011 Korm. (updated after the Fukushima accident). A regulatory guideline on the implementation of the PSR was also issued in the summer of 2016. The purpose of the PSR is to review the technical status and safety level of the facility in comparison with the national and international standards and best practices. During the review, those conditions have to be identified, which have to be fulfilled by the units in the next 10 years. The final review has to identify the actions which are going to improve the safety level of the facility in the next PSR cycle. The basis of the PSR in 2018 shall take into account the latest update of the nuclear safety code.	
27	Austria	Article 6	Section 6.1.3, p22, Annex 7, p145	What connection configurations are envisaged for the cross-connection between the essential power supply systems of the various units? With such a configuration, would the separation	The configuration contains series sectionalizing switches between the units, which are increasing the reliability of the backup supply system. In severe accident conditions, these lengthwise interconnections and crosswise couplings of bus bars can be used. This lengthwise and crosswise connection between the units can only be used for transferring the power of the safety distribution systems, so it cannot be loaded with nominal current in normal operation. By this, the separation can be maintained.	

				between safety trains still be maintained?		
28	Croatia	Article 6	6.3, 25	What are the design (or planned) lifetimes for the Budapest Research Reactor and for the Training Reactor of the Budapest University of Technology and Economics (if defined)?	The Budapest Research Reactor started to operate at the thermal power of 2 MW. Its reconstruction started in 1986 and the reactor was reinstalled six years later with 30 years of design lifetime. It expires in 2023. The design lifetime for the Training Reactor of the Budapest University of Technology and Economics is not defined. According to the Hungarian regulation, the Periodic Safety Review certifies whether the reactor can be operated safely for the next 10 years.	
29	Norway	Article 6	page 25	Can you please summarize the licensing process and gained experience from the core conversion of the Budapest research reactor.	The first step was the HAEA's decision-in principle permit for 2000 pc VVR-M2 LEU fuel purchase in 2007. An important milestone was the HAEA core conversion permit in 2009. The permit comprised of 15 proceeding steps, 3 hold points and 4 authority intervention points. For obtaining permission to proceed beyond the hold points and the intervention points, an approval was needed from the Reactor Safety Committee and from the HAEA. The conversion was performed in accordance with the Budapest Research Reactor's QA programme. The main chapters of the programme included: - The BRR QA work programme; - The conversion phases and steps; - Contents of repeated tasks; - Time schedule; - The staff education and training programme. The conversion hold points and intervention points were: - LEU fuel Site Acceptance Test; - Conversion process from HL1 to HL4 campaigns; - Test campaign; - Obtaining the operating license. The operators had to keep a record of every observation, every uncommon event in the operational diary and they established a summarizing database. This database included	

					the reactor physics, dosimetry, water chemistry data and the events. The Reactor Safety Committee evaluated every first cycle of HL and LEU campaigns. The Reactor Safety Committee also made a general evaluation after the end of the campaigns and sent a report to the HAEA. The HAEA evaluated the report, approved it and granted the permit for the next phase. It was ensured that the project steps are transparent and clear for every participant: for the operators, for the researchers and for the management. The conversion was made according to the programme without any kind of modification or alteration.	
30	Poland	Article 6	Page 20-21	Does the licensee conduct safety analysis while PSR in Budapest Research Reactor and the Training Reactor of the Budapest University of Technology and Economics? Does the licensee carry out probabilistic analysis in these facilities?	For the nuclear facilities including the research reactors in Hungary the Govt. Decree 118/2011 Korm. requires the conduct of periodic safety reviews. The technical status and safety level of the facility shall be reviewed every 10 years, in comparison with the technical solutions and safety requirements complying with the actual international requirements. During the review the licensee performs safety analysis. According to Hungarian regulation the probabilistic safety assessment shall also be performed, if a reliable database can be produced. The licensee of the research reactor shall endeavour to collect all the data, which may be utilized in a future probabilistic safety assessment. In practice, the database is not sufficient yet to perform PSA for the research reactor.	
31	Slovakia	Article 6	p. 22	The completed TSR actions are as follows: „Developing the Technical Support Centre within the ERO organization in order to be capable of managing multi-unit events;“	In the case of „all plant accidents” (or any unusual event which affects all 4 units) management tasks are taken over by the Emergency Response Organization (ERO), which operates according to special control and management methods. As written in the Report, emergency tasks and necessary tools and resources are specified in emergency response scenarios. The relevant, assigned, redundant and supplementary resources (by human, material or financial means) are supported for all/multi unit events. Staffing: The personnel of ERO is made up of the employees of the nuclear power plant, the assigned and seconded employees of the contractual partners of Paks NPP. The organizational structure, the positions and the requirements (number of people and	

				Please describe in more detail how are the accidents occurring simultaneously on all plants of the site managed at Paks NPP (staffing and equipment)?	skills) of the positions are included in the valid ERO staff table. Moreover, on-call duties for key positions and alternative shift-change personnel are calculated by the planning principles. Equipment: Planning methodology takes into consideration the expected and selected event groups within the specific emergency. Following this, it examines what quality and quantity of resources the specific emergency group requires to efficiently manage the performance of the protection and response activity. Related to the title of TSC- though the severe accident management (SAM), the general on-site emergency preparedness and response actions (on-site and off-site) are quite different activities, they are interrelated in a complex manner. Therefore Paks NPP organized the SAM (as nuclear event) activities as all/general emergency management tasks in such a way that the interventions on the unit(s) being under severe accident situation is controlled by the TSC working in the frame of ERO.	
32	Slovenia	Article 6	p.21	Modifications reducing the effect of high energy pipe ruptures Q.: Do you intend to carry out also modifications reducing the effect of moderate energy pipe ruptures (e.g. Fire Protection pipe)?	The MVM Paks NPP has not analyzed the pipes other than high energy ones for this reason, and there is no intention to modify these pipes.	
33	Slovenia	Article 6	p. 24	Spent Fuel Interim Storage Facility Q.: Is the Spent Fuel Interim Storage Facility seismically qualified on 0.25g	In the case of the Spent Fuel Interim Storage Facility the maximum design earthquake data is the following: the maximum horizontal acceleration of the free surface is 0.35 g. The maximum vertical acceleration of the free surface is 0.23 g.	

				(reference to chapter 14.2.3)?		
34	Ukraine	Article 6	page 22	The first bullet on page 22 provides statement on implementation of the new measurement system for severe accidents at Paks NPP. This is all information about this system in the report. Please provide more detailed description of this system features and functions.	Since the implementation of severe accident management (SAM) strategies depend on the determination of the plant status, in case of a severe accident, and the ability to estimate the magnitude of several key plant parameters, the required plant parameters have been identified and the availability of the instrumentation during severe accidents was checked during the development of SAM Guidelines. As a result, the implementation of a special Severe Accident Measurement System (SAMS) independent from the other plant instrumentation was defined, realized and installed. The access to the measurement data is provided in the unit control rooms (MCR), and the emergency control rooms (ECR) of each unit, as well as in the location of the plant Technical Support Centre (TSC). TSC is located in a protected area nearby the plant used together with the Emergency Response Organization (ERO), where four independent monitors of the SAMS are installed displaying for all -4- unit parameters satisfying the redundancy needs. Additionally all SAM hardware and software modifications are now implemented independently for all units.	
35	Austria	Article 7	Section 7.2.1, p30	The National Report does not provide any information on the measures Hungary has taken or plans to take to implement the Vienna Declaration on Nuclear Safety. To what extent does the new Nuclear Safety Code take into consideration the Vienna Declaration principles and/or the WENRA Safety	The detailed nuclear safety requirements are included into the Govt. Decree 118/2011 (VII.11.). The main decree is relevant for both existing and new nuclear installations. Design requirements for new NPPs can be found in its Annex (Volume) 3a. It is available via internet: http://www.oah.hu/web/v3/HAEAportal.nsf/web?openagent&menu=03&submenu=3_1 The requirements related to the Items of the Vienna Declaration are as follows: 1. Govt. Decree 118/2011 (VII.11.), Section 6 (4) and Section 6 (6) 2. Govt. Decree 118/2011 (VII.11.), Section 34 3. Govt. Decree 118/2011 (VII.11.), Section 3 (7).	

				Objectives for new nuclear power plants?		
36	Austria	Article 7	Section 7.2.3, p34	Could you clarify how many safety indicators are being used for NPP, waste repository, etc., could you please provide the list?	A The SPIS's three levels build up a hierarchical system (TABLE 1.). The three main evaluation areas are on the top of the system. Every area is made of part areas of safety indicators. The safety indicators are made of low level safety indicators provided with measurable and predefined evaluation criterion. The assessment of safety indicators is carried out on the basis of the results of low level safety indicators. TABLE 1 NPP ISFSF TR BRR NRWR RWTDF Main assessment areas 3 3 3 3 3 3 Indicators 22 10 12 12 10 10 Low level indicators 58 19 24 30 19 19 List of indicators of the main assessment areas - smooth operation, 1.1. Operational performance 1.2. State of systems and equipment 1.3. Events - safe operation, 2.1.Safety systems and equipment 2.2. Preparedness 2.3. Risk - safety culture; 3.1. Compliance with instructions 3.2. Human performance 3.3. Striving for improvement	
37	Greece	Article 7.1	p.36	Has HAEA exercised its right to impose financial penalties, so far?	Yes, HAEA has exercised its right to impose financial penalties. Since 2002, the authority imposed a financial penalty three times: • due to the 2003 fuel event: HUF 5 million • due to the import without a permit of NURES cleaning equipment in 2003: HUF 3 million • due to the unlicensed use of the sealing rings and due to the grade of materials at	

					generator units in 2008: HUF 10 million. HAEA has imposed a fine in connection with the use of radioactive material twice.	
38	Bulgaria	Article 7.2.3	page 33, Section 7.2.3;	The HAEA operates a multilevel inspection system to continuously assess the safety performance of facilities falling under the scope of the Act on Atomic Energy. Could you give more information regarding the multilevel inspection system?	The multilevel inspection system includes the following activities: inspection/audit of documents, on-site inspections, interviews, online inspections. The inspections can be comprehensive inspections (different dedicated areas, inspectors in groups, lasting tipically for a couple of days), revealing inspections (related to deviations or events), ad hoc inspections (related to decisions, resolutions). There are also audits of contractors, regular inspections related to outages (e. g. pressure and structural tests), inspection of works, inspection of licensing exams, inspection of manufacturers and online inspections (remote supervision of the facilities' significant parameters via online connection and review of licensees daily reports and logs).	
39	Slovakia	Article 7.2.3	p. 33	„The HAEA operates a multilevel inspection system to continuously assess the safety performance of facilities falling under the scope of the Act on Atomic Energy“. Please, explain the meaning of „ multilevel inspection system“.	The multilevel inspection system includes the following activities: inspection/audit of documents, on-site inspections, interviews, online inspections. The inspections can be comprehensive inspections (different dedicated areas, inspectors in groups, lasting tipically for a couple of days), revealing inspections (related to deviations or events), ad hoc inspections (related to decisions, resolutions). There are also audits of contractors, regular inspections related to outages (e. g. pressure and structural tests), inspection of works, inspection of licensing exams, inspection of manufacturers and online inspections (remote supervision of the facilities' significant parameters via online connection and review of licensees' daily reports and logs).	

40	Ukraine	Article 7.2.3	page 34	It is indicated in para. 7.2.3 on page 33- 34 that the system of performance indicators developed by the IAEA is used for Paks NPP for safety assessment. Based on this system, similar systems were developed for the spent fuel storage facility and research reactors. It is also stated that the performance indicator system is widely applied in regulatory actions, in particular, development of annual inspection plans. Please provide more detailed information on the performance indicator system for various facilities: How the calculated performance indicators are evaluated and are their boundary values	A The SPIS's three levels build up a hierarchical system (TABLE 1.). The three main evaluation areas are on the top of the system. Every area is made of part areas of safety indicators. The safety indicators are made of low level safety indicators provided with measurable and predefined evaluation criterion. The assessment of safety indicators is carried out on the basis of the results of low level safety indicators. TABLE 1 NPP ISFSF TR BRR NRWR RWTDF Main assessment areas 3 3 3 3 3 3 Indicators 22 10 12 12 10 10 Low level indicators 58 19 24 30 19 19 List of indicators of the main assessment areas - smooth operation, 1.1. Operational performance 1.2. State of systems and equipment 1.3. Events - safe operation, 2.1.Safety systems and equipment 2.2. Preparedness 2.3. Risk - safety culture; 3.1. Compliance with instructions 3.2. Human performance 3.3. Striving for improvement HAEA assesses the low level indicators in accordance with individually defined criteria and provides colour code for them. The safety performance indicators envelope the low level safety performance indicators, which are connected but non-replaceable by each other. The colour-based assessment of the indicator is made on the basis of the colour of the worst low level indicator within it. The particular area is assessed not only on the basis of the colour but other aspects are also taken into account from other sources. The information provided by the low level safety performance indicators help the HAEA to identify the problematical areas and necessary regulatory steps. The SPIS results show which area needs development, what actions are necessary in the area of	

				established? What actions are taken by the regulatory body if degradation of performance indicators is revealed (what procedure)? Does the public have access to the calculated performance indicators? Is this information provided on the regulatory body website?	human resources, systems, structures and components to raise the future level of performance. HAEA focuses on the areas where the indicators degrade and performs the necessary regulatory steps (for example inspections or other enforcement actions). The public has access to the summary of the regulatory assessments of Hungarian nuclear facilities and radioactive waste repositories. HAEA provides this information on the wesbsite regularly.	
41	Ukraine	Article 7.2.3	page 33	Is HAEA entitled to perform inspections without preliminary notification? If yes, in which cases does HAEA use this opportunity?	Yes, it is. HAEA is using inspections without preliminary notification, if the notification could potentially reduce the efficiency of the inspection, or in cases when HAEA has to respond quickly and there is no time for notifications.	
42	Austria	Article 8	Sections 8.1, 8.2, p37+43	Is the Minister of National Development, who now supervises HAEA, also responsible for the initiation of construction of new	It is the Minister of National Development who now supervises HAEA, but it is the government commissioner, Mr Attila Aszódi, who is responsible for the initiation of the construction of new NPPs. The Government is responsible for the direction and oversight of the safe use of atomic energy. The Government takes care of execution of the tasks laid down in the Act on Atomic Energy through HAEA.This means that HAEA is part of the governmental structure as a budgetary organization. Its annual budget is part of the Act determining	

				NPPs? If yes, how is the decision making without undue influence ensured for the licensing of the new NPP? The national report states on one hand (p37) that “The HAEA operates and deals with its budget independently; it is a state budget organization having chapter rights and individual title within the budget chapter of the ministry led by the minister overseeing the HAEA”, and on the other (p43) that “Its independent operation, financial management, and its independence within the state budget chapter is not of full-scope. In addition, the opportunity to request additional resources is not fully	the annual budget of Hungary. The Ministry of Economy is responsible of budgetary issues. Article 8 of Act on Atomic Energy states that the income of HAEA except for those from fines shall be used for its operation and it shall not be diverted for other purposes. If these incomes are not enough to perform the tasks laid down in the Act on Atomic Energy, the budget of HAEA should be completed by the state budget.	

				guaranteed during its annual operation if non-planned expenditures appear in connection with the regulatory work". Could you please clarify how the financial independence of HAEA is ensured and whether the financial resources for the performance of its regulatory functions are adequately provided by the legislation and in practice?		
43	Croatia	Article 8.1	8.1.1, 39	The HAEA is concluding bilateral agreements also with very distant countries, i.e. with Viet Nam Socialist Republic and the Republic of Korea. Could you briefly describe the scope and purpose of such agreements?	The purpose of the Agreement between the Government of Hungary and the Government of the Socialist Republic of Vietnam on training, research, regulatory and technical cooperation in the peaceful uses of nuclear energy signed in Budapest, on 16 September, 2013 is to promote and support the cooperation between their competent organizations in peaceful uses of nuclear energy, in the field of nuclear human resource development, training, research and scientific, technical and regulatory activities. Areas of cooperation are: (a) Vocational training, specialized theoretical and practical training of lecturers, researchers, engineers and technicians; (b) Higher education, both theoretical and practical, graduate and post-graduate training; establishment of the educational infrastructure for higher educational institutions or nuclear power plants; development and/or adaptation of educational	

					methodologies for the training of nuclear experts; (c) Production, supply, installation and maintenance of devices, equipment, technologies, models, audio-visual materials, simulation programmes and other electronic training materials and demonstration software applications used in the course of theoretical and practical education and in educational and research laboratories; (d) Basic and applied research and development; (e) Cooperation between regulatory authorities with special regard to the establishment of a nuclear safety authority system; (f) Enhancement of the public acceptance of nuclear energy; (g) Exchange of scientists, technical experts, specialists. The purpose of the Agreement between the Government of Hungary and the Government of the Republic of Korea for cooperation in the peaceful uses of nuclear energy signed at Seoul, on 18th October, 2013 is to encourage and promote cooperation in the peaceful uses of nuclear energy. The areas of cooperation are: (a) basic and applied research and development with respect to the peaceful uses of nuclear energy; (b) research, development, design, construction, operation and maintenance of nuclear power plants, small and medium-sized nuclear reactors or research reactors; (c) manufacture and supply of nuclear fuel elements to be used in nuclear power plants, small and medium sized nuclear reactors or research reactors; (d) research and development in the field of nuclear fuel cycle including radioactive waste management; (e) production and application of radioactive isotopes in industry, agriculture and medicine; (f) nuclear safety, radiation protection and environmental protection; (g) nuclear safeguards and physical protection; (h) nuclear policy and human resources development; (i) enhancement of public acceptance of nuclear energy. Texts are available on the website of the HAEA:	

					http://www.oah.hu/web/v3/HAEAportal.nsf/web?openagent&menu=03&submenu=3_6.	
44	Croatia	Article 8.1	8.1.3.3, 43	The HAEA established the Hungarian Nuclear Knowledge Management Database. Could you list the contents of the Database? Who are the intended users?	The “Hungarian Nuclear Knowledge Database,” has limited access. It is restricted to users only of contractual partners. The founding members of the database are fourteen Hungarian organizations from the nuclear field (facilities, TSOs, universities, etc.). The database stores the research papers, reports and knowledge obtained by the participants at various conferences, workshops and seminars, technical papers, plans, authority decisions, analysis reports, etc. It also contains international requirements and regulations thar are available on the internet.	
45	Norway	Article 9	page 44	Please explain the content of training of maintenance personnel and the requirement for individual qualification.	Training of maintenance personnel: Maintenance training (similar to operational personnel training) is job-oriented and it consists of inter-connected modules. Special conditions apply to the training of maintenance personnel as stipulated by the Decree 55/2012 NFM of the Minister of National Develoment, in paragraph 4, point 6: the licensee may issue permission to work under supervision in the maintenance, civil work and investments areas – excepting the scope of duties relevant to nuclear safety. Permission to the work under supervision can be issued to those, who fulfill the qualification and examination requirements set for the given work activities, and also have suitable health, physical and psychological condition. The supervised worker may perform his tasks only under the continuous supervision and directions of a licensed independent worker. Sequential parts of maintenance training: 1) initial training module „A”, 2) initial training module „B” for works in radiation conditions, 3) initial training module “C” for basic safety culture issues, 4) training program for job-specific work under supervision, which contains theoretical and practical trainings in the maintenance training center and/or maintenance workshops, and also thematic on-the job training modules. The work under supervision contains the following modules (450 hours training):	

					- SSCs basics (30 hours), - working rules (6 hours), - job-specific equipment maintenance theoretical course (22 hours), - job-specific maintenance practical training (73 hours), - on-the job practical training (min. 2 outages – approx. 320 hours). Yearly refresher training is obligatory for the licensed supervised workers, and they also have to pass the Maintenance Procedures exam. 5) The fourth training is for independent workers, who train the workers for the company license examination. Licensed independent workers may be appointed a responsible work-leader to control the activities of licensed supervised workers according to the related maintenance process procedure. It contains the following modules (approx. 416-420 hours): - nuclear maintenance basics (81 hours), - work-leader training (19 hours), - on-the job maintenance practical training module (2 outages – approx. 320 hours) The independent workers should pass written, oral and practical examination of each module to obtain a company license, or special company license for selected positions. Subjects of company license examination: - plant technological equipment and system knowledge, - maintenance technological procedures, - maintenance process procedures and administrative/documentation requirements, - special tools, maintenance materials and consumables, - failures happened in the professional area, changes regarding to scope of duties, events. 6) Training of coordinators is the fifth maintenance training stage . The licensed coordinators are entitled to supervise and control plant and contractor personnel performing nuclear installations maintenance and modification activities. The supervisor is able to manage all work documentation, and to officially represent the plant in relation with contractors. The coordinator training module takes 42 hours. The detailed job-specific training programs were developed based on the SAT methodology. These training modules contain the theoretical courses and thematic	

					practical trainings relevant to the professions. The leaders of the professional organizations and training organizations review, while the responsible division head approves the training programs including the topics of theoretical course modules, examination requirements, the test questions of exams, the practical training programs, the questions of company and regulatory authority exams.	
46	Norway	Article 10	page 47	Could you provide more information on the man-machine interface at the main control room of the Paks NPP (indicators, support system, safety and others)?	Electric supply: The control and indicator panels and switchboards of the main control room are all supplied by category I electric supply (UPS/Emergency Power Supply). The main characteristics of electric power supply are as follows: Safety related UPS, triple redundancy and diversity Doubled, direct current power supply with diversity. All safety related measures and equipment are supplied by first class supply systems belonging to reliability category I. The final safety report demonstrates the compliance with the Nuclear Safety Code and all related regulations. The supply of the main control room complies with EUR requirements. Instruments, Information: The existing unit control room instrumentation meets the requirements that ensure safe and long-term operation. Ergonomics, air quality: The climatic requirements are provided. In case isolation of the main control room is necessary due to accident or malfunction, dose calculation was prepared. According to the calculations, after the event the use of iodine filters results in a reduction of the dose to an acceptable level. The selection of operator chairs is based on ergonomic criteria. The choice of colours and surfaces in the main control room assumes 24/7 usage. Architectural, fire and earthquake protection compliance: The main control room as well as other buildings of the power plant had a structural strengthening. In order to reduce the amount of fire load from the built-in materials, all the main control rooms have ceramic flooring that are not combustible. The proper air tightness of main and emergency control rooms is assured. To prevent spread of fire,	

					fire-proof doors are used. Computer systems: The processes of the nuclear power plant are automated to a large degree. To get information of the processes taking place in the reactor we have multiple sources: first we have a computer system with sufficient redundancy that provides data, on the other hand, the reactor protection system also provides information to the operators. Safety systems: We use triple redundancy for safety related systems.	
47	South Africa	Article 10	Section 10.1	Please list any of the regulatory requirements and guidance documents, or refer to another section.	There are requirements in the Govt. Decree 118/2011 (VII. 11.), CHAPTER I, Section 8 regarding the development of the safety policy of the licensee. There is also a general obligation concerning the execution of the safety policy in the Govt. Decree 118/2011 (VII. 11.), CHAPTER IV, Section 28.	
48	South Africa	Article 10	Section 10	The section should specify the regulatory processes for monitoring and oversight of arrangements used by the licence holders to prioritize safety.	Section 10 says that each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety. By the interpretation of this Section, Section 10 refers to nuclear safety policies of nuclear installations, and not only for regulatory processes. The National Report Section 10., although it is not needed, gives a general overview about objectives, responsibility, basic principles and the practical side of HAEA's work, but the Section deals with nuclear installations, about their policies. However, only units 1-4 of Paks NPP fall under the scope of the Convention on Nuclear Safety, Hungary has decided to include more information, i.e. on MVM Paks II Nuclear Power Plant Development Ltd., too, since the Ltd. is already also a licensee.	
49	South Africa	Article 10	Section 10.3	How does the HAEA verify the re-qualification of MVM Paks Nuclear Power	The MVM Paks Nuclear Power Plant Ltd. sets the re-qualification exams for the operators itself, and the HAEA inspects the examination process sending/delegating inspectors. The inspector supervises all the examinations.	

				Plant Ltd, operators? Does HAEA set the qualification/re-qualification examination for operators?		
50	United States of America	Article 10	Section 10.1 and 10.3.2	(1) How does HAEA assess the safety culture of a nuclear installation? (2) What type of follow-up actions could HAEA take if they determine an installation has a poor safety culture? (3) What legal protections are in place for individuals (HAEA employees, nuclear installation employees, or other) who raise safety concerns?	(1) Based on the legislative framework, HAEA performs yearly inspections in connection with the level of the licensee's safety culture including its self-assessment. Furthermore, HAEA is collecting the relevant data from the inspections and events which are the bases of HAEA's evaluation using the safety performance indicators. (2) HAEA has a policy for Enforcement (P-0-2) that applies to all nuclear facilities and radioactive waste repositories. In addition to the application of enforcement actions (i.e. warning, order of a corrective measure or an additional condition, limitation or termination of an activity) the Act on Atomic Energy provides the potential for HAEA to impose public administration fine, if it observes the violation of the Atomic Act, an implementing decree or a regulatory resolution. In practice, HAEA identifies weak points, explores the causes and indicates the management of the licensee, then discusses the issues during meetings with the managements. (3) According to the Annex 2 of Government Decree No. 118/2011 (VII. 11.): "2.2.2.0100. The managements of the licensee organisations and the supplier organisations shall consistently and definitely expect and support the attitude required for a strong safety culture at all levels, and shall ensure that the employees recognise and understand the key considerations of safety culture. Among other things, they shall implement this in such a way that they do not support excessive self-confidence and encourage an open reporting culture and a questioning attitude, which prevent activities and conditions unfavourable from a safety point of view."	
51	Canada	Article 11	pp.51-54, Section C: 11	a. How does Hungary ensure that training addresses changing procedures, equipment, and	a. Procedures – which are required for training planning – are reviewed regularly, generally once every three years. During the review, changes shall be incorporated. The training materials must be reviewed every three years as well. In addition to the reviews, the changes of processes, equipment and laws are immediately introduced into the training material.	

				regulatory requirements? b. Are training program evaluation processes regularly applied to assess effectiveness of training programs? c. Does Hungary have procedures/processes in place for conducting classroom training, On-the-Job training and simulator training? d. Does Hungary have a process in place for scheduling and delivering training to personnel?	b. Yes, they are. c. Yes, such trainings are continuously organized. According to our experiences, the simulator training is very effective. d. The individualized training plans are prepared.	
52	Croatia	Article 11.2	11.2.1, 55	The staff of the HAEA was practically doubled by recruiting 80 new co-workers. Hiring so many employees in short time period seems like a big	The training programme of the inspectors, depending on whether nuclear safety, security or safeguards inspectors are concerned, lasts 1-3 years. The first part of the programme is a very intensive classroom training (more than 1 year for safety inspectors), in which the TSOs are involved and we also make use of the licensees' training systems. After the theoretical exams a tutoring system commences, where senior inspectors involve the tutees in the regulatory work (licensing, inspections, safety assessment) and they acquire practice in their specific professional field (e.g. mechanical, radiation protection, civil engineering, etc). At the end of the training	

				challenge from the training/education point of view. How much time will be needed to train/educate new staff to be able to perform the duties on their own? Will the training and education be performed by existing HAEA staff or external help will be needed?	programme an inspector exam shall be passed, after which the inspectors may proceed individually in a regulatory case.	
53	Germany	Article 11.2	p. 55	In the report it is said that HAEA nearly doubled its staff. Could Hungary elaborate on the training processes of those co-workers? In addition, what are the measures to achieve a satisfying knowledge transfer? Will the recruitment of new staff be continued with regards to the new build project?	The training programme of the inspectors, depending on whether nuclear safety, security or safeguards inspectors are concerned, lasts 1-3 years. The first part of the programme is a very intensive classroom training (more than 1 year for safety inspectors), in which the TSOs are involved and we also make use of the licensees' training systems. After the theoretical exams a tutoring system commences, where senior inspectors involve the tutees in the regulatory work (licensing, inspections, safety assessment) and they acquire practice in their specific professional field (e.g. mechanical, radiation protection, civil engineering, etc). At the end of the training programme an inspector exam shall be passed, after which the inspectors may proceed individually in a regulatory case. Knowledge transfer is to be provided via the tutoring system. The recruitment will continue in 2017 with hiring another 40 new staff members. The main purpose of this is for the new builds, however, the new regulatory tasks assigned from 2016 (radiation protection authority functions, civil engineering authority functions within facilities) are also an important reason.	
54	Poland	Article 11.2	Page 54-55	Do all inspectors of HAEA carry out all	The HAEA inspectors are authorized to carry out inspections individually only after participating in the introduction training (2-3 years) and passing the inspector exam.	

				types of inspections (e.g. Electrical, construction, I&C, mechanical, chemical) or they have a narrow fields of specialization typical for a particular inspector?	Nuclear safety inspectors implement inspections in accordance with professional qualifications. If the inspection covers several professional areas, group inspections are performed with the participation of inspectors from different professional areas.	
55	Canada	Article 12	p.58 section 12.5	The techniques described here to analyze events that have Human Factors implications are commendable. Do you find that they have significantly reduced errors?	The main aim of the technique is to support the indentification and fix the factors which could have negative impacts on human performance. There are some improving trends related to the number of reportable events and recently, no significant events were identified that occured at Paks NPP due to human error.	
56	Norway	Article 12	58	Does HAEA use the operating experience of retired staff of Paks NPP? If yes, how?	No, HAEA does not use the operating experience of retired staff of Paks NPP directly. Paks NPP has a knowledge management system to retain the experiences of retired staff.	
57	South Africa	Article 12	Page 58, 12.3	Does the Labour Code requirement of 300 hours maximum overtime applies to normal and accident conditions? ie can it be required to work	The Labour Code requirement of 300 hours maximum overtime applies to normal conditions. Overtime work may be ordered without limitation in the interest of the prevention or mitigation of any imminent danger of accident, natural disaster or serious damage or of any danger to health or the environment.	

				more than 300 hours if it is an emergency?		
58	Ukraine	Article 12	page 56	The role of the regulatory body in the implementation and assessment of human factor issues was not described in the report. Could HAEA give more information about the relevant regulations and inspection program? Does HAEA perform safety culture assessment or participate in examinations, issue permissions, etc.?	Volume 2 of the Nuclear Safety Code (NSC) (which is based on IAEA GS-R-3) contains the requirements on Management System. NSC Volume 1 contains the requirements related to nuclear safety authority examination of employees. Volume 4 contains the requirements related to organization, training and competences. HAEA oversees the Licensee's activities including human and organizatonal factors based on NSC requirements. Planned inspections according to the annual inspection plan, ad hoc inspections related to events and periodical reports of the Licencees are the bases for the safety and performance indicators used to evaluate safety performance. HAEA assesses the licensees' safety culture within the frame of the annual safety performance assessment, where one of the evaluation area is safety culture. Based on the legislative framework, HAEA yearly performs inspections in connection with the level of licensee's safety culture including its self-assessment. Furthermore, HAEA is collecting the relevant data from the inspections and events which are bases of HAEA's evaluation using safety performance indicators.	
59	United States of America	Article 12	Section 12.4 Pg 58	The process of life extension from the initial 30 years to 50 years is in place and being implemented. (1) Has there been any discussion about the possibility of extending life by an additional 20 years and whether the existing life extension	1) So far there hasn't been any discussion about the possibility of extending life by a subsequent 20 years and at the present time this questions is not on the table. 2) MVM Paks NPP already received the lifetime extension licence for Unit 3 in 2016. The licence renewal application of Unit 4 was submitted to HAEA in December 2016. Paks NPP expects receiving the licence by the end of 2017.	

				process would be sufficient? (2) Also, please provide an update on the status of lifetime extension activities for Paks Units 3 and 4.		
60	Austria	Article 13	Section 14.3, p69	Does Paks II design fulfil the Principle 1 of the Vienna Declaration on Nuclear Safety? Has this principle been proven in the safety analysis (e.g. as a part of the Preliminary Safety Information Report) submitted to the HAEA so far?	The goal of the Preliminary Safety Information Report is to provide preliminary, but generic design information to the regulatory body. Due to its generic nature, it does not contain site-specific design solutions, so it is not possible to fully evaluate compliance with Principle 1 of the Vienna Declaration on Nuclear Safety. But this is not its goal. The Hungarian legal requirements on nuclear safety are in line with the principles of the Vienna Declaration on Nuclear Safety. In the Construction License Application (CLA) the licensee has to prove that the NPP design is in line with the Hungarian requirements, and thus with the Vienna Declaration on Nuclear Safety. So far, HAEA has not received the CLA.	
61	Canada	Article 13	Section 13.4.2/ 13.6	Is CFSI (Counterfeit and Suspect Items) being considered by the HAEA during the oversight inspection of the licensees? Does Paks have a CFSI process in place?	HAEA is familiar with the problem and made a proposal for introducing legal requirements regarding Counterfeit and Suspect Items (CFSI) within the scope of the legal framework revision, which is currently in progress. When these come into force, HAEA will issue a guide for handling CFSI-related issues. Currently, both the HAEA and the Paks NPP handle these issues as other non-compliances.	

62	Poland	Article 13	Page 64	Does the HAEA carry out inspections due to detect and prevent ageing effects of facilities? Are these inspections part of ageing management of facilities?	According to the Hungarian Nuclear Safety Code and Safety Guides the licensees shall have ageing management programmes. These programmes integrate the specific plant programmes in order to detect the ageing effects. Especially the inservice inspection programme (which is subject to regulatory approval) is meant to provide the integrity of the SSCs. The HAEA carries out inspections to confirm the compliance of the inservice inspection with the regulations. In addition, the comprehensive inpsections implemented regularly at the licensees also deal with the ageing management and inservice inspection programme. The results of the inservice inspections are submitted as part of the periodic reports of the licensees and of the annual ageing management report. These reports are also assessed by the HAEA.	
63	Canada	Article 14	Section 14.1.2, p.66	The report states that, “The HAEA follows the implementation of the improvement measures of the PSR and the experiences gained were used in the evaluation of the Service Life Extension Programme of Paks NPP units. (See details in Chapter 6.2.1. and 6.2.3.)” Reviewer could not trace this reference. Can Hungary provide a brief highlight of the experiences gained in the Life	The Long Term Operation programme at the MVM Paks NPP: 1. Scope of licence renewal (LR) and the Ageing Management (AM) Renewing the operation license is based on the judgement on the plant safety. The scope setting basic rule is that all safety related systems, structures and components (SSCs) have to be included into the scope of LR. Those non-safety-related SSCs have to be also considered the failure of which can jeopardise the safety functions of the safety related SSCs. The active components can be screened out from the scope of the AM, since those are managed within the scope of Maintenance Effectiveness Monitoring programme and/or replacement programmes. These plant programmes are independent from the tasks of LR and they are subject of licensee regular reports to HAEA. 2. Development of ageing management program To comply with the requirements of relevant regulation, the NPP should have an integrated ageing management program. In this, degradation-type programs and component-specific programs should be drawn up and implemented in order to manage the degradation mechanisms of components within the scope of ageing management. 3. Survey for the condition of the SSCs The SSCs health and condition monitoring is a routine plant activity. Therefore the plant has up-to-date information and database on the discovered failures and the actual condition of all SSCs. The requirements related to the inspections, as well as the applied techniques, are subject to continuous improvement.	

				Extension Program of the Paks NPPs?	Independently from these plant activities, a one-time inspection was performed to augment the routine inspections to make sure that all available information for the condition of the SCs was evaluated. Therefore a special programme was developed, conciliated with the HAEA. 4. Time Limited Ageing Analyses During the design, the degradation mechanisms/ageing effects of the selected components were analysed with respect to the limitation of the operation time (Time Limited Ageing Analyses: TLAAs). Since the results of the TLAAs may appear invalid, if the design lifetime is extended and/or the parameters or the frequency of the loads or other circumstances are changed, consequently, the validity of TLAAs had to be reviewed. The scope of the TLAAs to be managed is based on the FSAR review and an overview of the TLAAs scope used in the USA for LR and also the consideration of the relevant IAEA document. According to the requirements, it has to be demonstrated that the analyses remain valid, or the results of analyses can be projected, or the effects of ageing on the intended function(s) will be adequately managed for the period of long-term operation (LTO). 5. Modification to the Final Safety Analysis Report (FSAR) The FSAR is considered to be a living document describing the actual plant configuration and state of plant safety. The FSAR has to be converted into a “Licence Renewal-compatible” report, reflecting all necessary changes initiated by the LR process. To prepare the new release, a detailed program has been set up in the programme, identifying the modifications and additions needed to the FSAR. 6. Modification to other operational documents The handling of system and system components are specified in various procedures, namely in the symptom-based emergency operating procedures, shutdown symptom based emergency operating procedures, abnormal operating procedure, the operating procedures of the system, test procedures and the owner’s manuals. The limitations and operation options should include the results of analysis and calculations for LTO. By checking all relevant documents and developing the proposed amendments, we have incorporated all the necessary information into the relevant procedures.	

					The renewal of the Operation License requires that the effectiveness and suitability of the lifetime management program and the adequacy of the technical/safety assessment is demonstrated by the power plant as early as during the design lifetime. Ageing management of the major items of equipment of the power plant is a key technical issue for the service life extension. The ageing processes may be influenced by the design and manufacturing features of the major items of equipment, the technical reviews and the maintenance practice used in the power plant, and the reconstruction and renewal works. The confidence and the support of the public are inevitable for the service life extension.	
64	Poland	Article 14.2	Pages 67-69	Does the HAEA carry out inspections with the participation of TSO? What kind of inspections require the participation of TSO?	There were some examples when TSO partners were involved in the regulatory inspection procedures, but this is not typical. Usually the inspections are carried out by the HAEA experts without any contribution of TSO partners. TSO partners sometimes provide support during regulatory assessment of submissions, license applications or reviews of safety analysis. In this respect TSO partners are requested to carry out control calculations to confirm analyses results of the licensee. The HAEA generally cooperates with TSO partners on different fields, where the necessary specific knowledge or human resources are not available internally.	
65	Slovakia	Article 14.2	p. 68	„The Licensee has completed the modifications necessary to be able to implement the severe accident management guidelines“. Implementation of containment overpressure protection occurring	The under pressure phenomena during severe accidents have been investigated in frame of Level 2 PSA by MAAP4 analyses. Probability of containment failure due to under pressure for Paks NPP was so low that it was screened out. However, SAMG includes some measures for this case (air- and/or N2-injection if it is possible).	

				during severe accident shall be completed in near future. What are the measures to prevent possible containment failure due to under pressure in containment under SA conditions?		
66	Slovenia	Article 14.2	p. 69	…if severe accident conditions occur include measurement means for reactor pressure, core outlet temperature, water level…spent fuel pool level… Q.: Can you explain if the measurement sensors for measuring reactor pressure, temperature and spent fuel pool level are qualified for severe accident conditions?	YES qualifcation was performed for those that are meant to be used during SA process. Environmental parameters (SA pressure, temperature, humidity, dose) have been calculated for each sensor in real place to be installed. These parameters were recorded in the first step, in the technical specification.	
67	Canada	Article 15	Section 15.3.2, p.75	The report states that “The dose planning, radiological	a. To reduce the exposure there is an opportunity to carry out the training and refresher programmes in inactive conditions in the Maintenance and Training Centre. The centre	

				permission of particular operations in refuelling outages and identification of necessary radiation protection measures are based on the comprehensive radiation level measuring programme performed by the health physics…" a. Has the Paks NPP licensee performed any worker related dose reductions studies to ascertain how their individual work practices based on occupancy can be mitigated to reduce their exposure dose during fueling outages? b. Could Hungary provide details of the "comprehensive radiation level	comprises of a reactor, a steam generator and other types of equipment - identical to the original equipment - assuring specific conditions for educational and training purposes. By practicing the works under non-radioactive conditions, the time which the workers spend in the radiation field could be significantly reduced. b. During outages Paks NPP has been carrying out a dose rate measuring programme in the surroundings of the main equipments (reactor, primary circuit, steam generator, reactor coolant pump, reactor water clean-up system, etc.) since the first outages with minor changes. The changes of the dose rate in the surrounding of the main equipment could be monitored. The basic objective of this measurements is the monitoring of the radiation conditions, which we can use for the optimisation for particular operations to be carried out during the outages.	

				measuring programme”		
68	Canada	Article 15	General	In the 6th National Report for Hungary, the IRRS and the OSART missions identified staffing gaps and the need to develop a long term staffing plan in order to assure the retention of technical expertise and knowledge. This deficiency or challenge was not referenced in Article 15 and how it is being resolved was also not mentioned. Have the staffing gaps been identified? Has a long term plan been developed? How do these staffing gaps affect the Environmental Programs and their compliance reviews?	The MVM Paks NPP launched an action regarding ensuring human resources in the frame of Strategy for 2014-2016. As a part of this Strategy, a project named Long Term Human Resource Planning at MVM Paks NPP has been initiated. The aim of this project was countinuously ensuring the qualified and properly trained personnel in a predictable manner for the safe and effective operation of Paks NPP. The milestones of the project: 1) Development of a pilot programme involving three organisational units 2) Based on the evaluation of pilot programme development of long term human resource plan for the whole organisation. 3) Development of a human resource plan for the whole organisation. 4) Development of IT support for the management of the long term human resource plans. The HAEA developed a staffing plan in order to prepare for the extending tasks (new units, waste storage repositories, radiation protection, general construction authority tasks). In 2015 its implementation has started and approximately 80 new employees started working for HAEA. An additional 40 employees will be hired in the course of 2017. All of them are required to pass the general and specific introductory training programme.	

69	Greece	Article 15	p.73, par. 15.3.1	Can you please provide more information regarding what the full-scope operative dosimetry monitoring consist of?	The internal radiation protection regulations (Plant Radiation Protection Code) of the MVM Paks NPP Ltd. specify the full-scope operative dosimetry monitoring. To the operative personal dosimetry control are applied by eletronic personal dosimeters (EPD). The full range of workers (the plant personnel and outside personnel) who work in the Radiation Controlled Area (RCA) must wear electronic personal dosimetry from 21th March 2013, regardless of the fact, if they are working in the main building or only in the so called health building. The EPDs are important tools in the occupational radiation protection, they give an opportunity to the continous monitoring of the radiation exposure by the permitted dose and dose rate levels. The recorded doses by the EPDs are related to specified works, rooms, units. This dose data helps us to identify organisational and technical measures which can result in lower collective and personal doses of the activities.	
70	Lithuania	Article 15	Page 76, chapter 15.3.3	Could you please specify if the monetary value of man-sievert is used for optimization of radiation protection at NPP. If yes, please specify what level of this value is acceptable and who is responsible for establishment and recalculating of this value and in which cases do you recalculate it?	Work should be optimized for radiation protection during preparation and planning of the work. For the optimisation we mostly use qualitative methods, because it is difficult to quantify the evaluation criteria of the organisational and technical measures which can result in lower collective dose of activities. For decision making, if it is difficult to quantify the evaluation criteria, the suitable planning aspects and radiation protection measures should be selected on the basis of experts' judgements. If necessary, the differential cost-benefit analysis is used to the optimisation, which determines the optimal level by evaluating the benefit from the radiation protection costs and reduction of radiation exposure. The method examines the costs expended on protection and saving of collective dose with the possible alternatives. The method compares the increase of the costs expanded on protection with saving of collective dose. This comparison is implemented by using the cost-benefit ratio. After determination of the cost-benefit ratios the values are compared with the reference value. The reference value is the determined value (alpha value) of one man*mSv dose. The optimal solution is, which has the highest cost-benefit ratio below the costs determined for one man*mSv dose. 25.000 HUF is the cost determined for one man*mSv, which is reviewed yearly. The head of the Radiation and Environmental Protection Department coordinates the alpha value with the controlling and monitoring	

					authority and after the company accepts the value, the administration authority approves it.	
71	Norway	Article 15	page 75	What type of action do you engage if the internal exposure exceeds the investigation level?	If the internal exposure value exceeds the investigation level (0.1 mSv), the manager of the Personal Dosimetry Laboratory investigates the incident according to the Plant Radiation Protection Code. He asks the affected worker questions and concludes where, when and during what kind of work the incorporation happened, and who were the related employees. The extraordinary internal exposure control is performed in the case of these employees. We inform the radiation protection supervisory authority about the case that reached the level of investigation. If during the whole body counting the detected Cs-137 isotope reaches 5000 Bq and it is proved that the value does not come from surface contamination, the internal exposure assessment is extended for excretion measurement of alpha emitting isotopes, which is initiated at the radiation protection authority.	
72	Ukraine	Article 15	page 76, Table 15.3.2-2	Tritium dose is provided. However, to calculate the tritium doses, it is needed to apply respective dose coefficients for different forms of chemical compounds and justify the selection of these coefficients. Is it possible to give additional explanation for what tritium	The calculation of tritium doses is performed with MONDAL software by setting the following parameters: • Software Version: 1.0 MONDAL • entrance path (path of intake): inhalation, AMAD 5 • radionuclide 3 H • chemical form: tritiated water (tritiated water) • Recording mode (mode of intake): acute (acute) • measuring urine concentration (concentration in urine Bq / l) • The time between recording and measurement: 14 days (we usually do not know the exact time of shooting, we expect mid-term)	

				form(s) this dose was calculated?		
73	Ukraine	Article 15	page 77, Sec. 15.4.1	Please explain what radionuclides were taken into account in calculation of public doses resulting from NPP releases. Were there calculations for tritium and carbon 14?	Airborn releases: Ar-41, Kr-85, Kr-85m, Kr-87, Kr-88, Xe-133, Xe-135, H-3 (HT), H-3 (HTO), C-14 (carbon dioxide form: CO2), C-14 (organic form: CH4), Sr-89, Sr-90, Na-24, K-42, Cr-51, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Se-75, As-76, Nb-95, Zr-95, Mo-99, Ru-103, Ru-106, Ag-110m, Sb-124, Sb-125, I-131 (aerosol form, elementary iodine and organic form of iodine separately), Cs-134, Cs-137, Ba-140, Ce-141, Ce-144, Eu-154 Liquid releases: H-3 (water form of hydrogene), C-14 (carbonate form of carbon), Sr-89, Sr-90, Fe-55, Ni-59, Be-7, Cr-51, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Mo-99, Ru-103, Ru-106, Ag-110m, Sb-124, Sb-125, I-131, Cs-134, Cs-137, Ba-140, Ce-141, Ce-144, Eu-154, U-group, Pu-group, Am-group, Cm-group ("group" : it means gross activity the possible U or Pu or Am or Cm radioisotops in liquid releases.)	
74	Croatia	Article 16.1	16.1.3, 82	On page 82 the National Nuclear Emergency Response Plan and the associated guidelines are described. Are the Plan and the guidelines publicly available documents?	The Plan is not available to the public. The guidelines are available to the public via the webpage of the HAEA, except one guideline that contains detailed and sensitive information about the facilities.	
75	Croatia	Article 16.1	16.1.4, 83	Are there any plans to bring the Hungarian emergency planning zones (fully) in line with the recommendations	The revision of the National Nuclear Emergency Response Plan should be undertaken until the end of 2017. During this procedure the relevant international requirements (GSR Part 7, and PR-NPP-PPA, etc.) are to be considered. The chosen distance of EPD is not yet decided. The EPR-NPP-PPA’s idea of the complete prompt evacuation of the UPZ (in all directions) after an accident is not yet decided upon either.	

				from the IAEA publication EPR-NPP Public Protective Actions (2013)? For instance, will the Extended Planning Distance (EPD) with the suggested radius of 100 km be introduced?		
76	Germany	Article 16.1	p. 85	In the report it is said that Hungary regularly takes part in different kind of emergency exercises (INEX, CONVEX, ECURIE and others). Could Hungary elaborate on lessons learned from the emergency exercises?	All organizations involved in national or international emergency response exercises perform an evaluation report after the exercise. Based on the findings of the evaluation reports of the participating organizations, the national coordinator of the exercise compiles a national evaluation report, which in case of an international exercise is sent to the coordinator of the international exercise. The lessons learned during the emergency response exercise can be found in the final report published by the international coordinator. The feedback of lessons learned has to be made by the organisations independently, however, the national evaluation report and the action plan included is approved by the Inter-ministerial Co-ordination Committee on Disaster Management, pressuring the organizations on the execution of the corrective actions. Based on the latest exercises, it could be concluded, that the national emergency response system works properly. However, the frequency of exercises of notification, evaluation and decision making procedures must be maintained to obtain the proper routine. Additionally, the notification of and communication with international organizations requires more IT competent staff.	
77	Greece	Article 16.1	p.82 par. 16.1.3	We believe that a simple, comprehensive diagram of the organizations	The organizations involved in the preparation of the Emeregncy Response Plan are the same involved in the emergency response system. Unfortunately a "simple" diagram does not exist, and the comprehensive but very complex diagram (also containing numerous organizations with less competencies) does not provide more information to understand the Emergency Response Plan.	

				involved in the Emergency Response Plan might be helpful in describing the plan.		
78	Greece	Article 16.1	p.82, par. 16.1.3	Can you please specify who has the responsibility to communicate with EU and IAEA authorities in case of emergencies?	The main responsibility is with the HAEA, being the Competent Authority. It informs the EU, the IAEA and countries with bilateral agreements about the accident. However, the Ministry of Foreign Affairs and Trade is also responsible to notify embassies.	
79	Greece	Article 16.1	p.83, par. 16.1.4	As it mentioned in the report, within the 300km protective actions zone of foreign nuclear power plants, the same legally determined intervention levels shall be applied as for the similar planning zone of Paks Nuclear Power Plant. Can you please explain whether Hungary intends or plans to take actions towards harmonization of its interventions levels and overall response with the neighboring	As part of the implementation and transposition of the Council Directive 2013/59/Euratom, the way of harmonization of the intervention levels with the neighbouring countries should be incorporated in the national legal framework until the end of 2017. Having done that, the bilateral agreements with the neighbouring countries may be modified.	

				countries, as recommended, for example, by the HERCA-WENRA approach?		
80	Greece	Article 16.1	p.85, par. 16.1.6	In the report it is stated that: “The national and international nuclear emergency response exercises held in recent years demonstrated the adequacy of the laws governing the disaster management and national emergency response system developed within the modern state administration structure.” Could you please clarify what is meant by the term modern state administration structure	In the original Hungarian language text the term “modern state administration” refers to the public administration reform that started in 2010 and is still going on completing many sub-tasks. The defence administration that is based on public administration is affected fundamentally by the establishment of the governmental bureau with the alteration of the districts and the configured centralized organization structures. The practice proves – as the State Audit Office of Hungary’s report also mentions it – that the newly founded organizational structure and the institutional system serve the safety of life and property of the population more efficiently.	
81	Greece	Article 16.1	p.86, par. 16.2.1	The development and operation of the application for smart phones and tablets	Hungary highly appreciates the positive comment. The main purpose of the Emergency Information Service (VESZ) is to provide valid, factual information for the public about any kind of emergency as soon as possible. As we operate this application continuously and reliably during times of more frequent emergency situations (e. g.	

				called Emergency Information Service (VESZ) is an action implemented by Hungary, which is worthwhile to commend and/or can be considered as a good practice. Apart from the above comment, we would also like to ask whether this application has been tested and evaluated, for instance in the course of exercises.	floods, extreme winter weather) – other than nuclear emergency response situations – there is no need for tests in the course of exercises. Since this system has been developed to provide information about real events, the use during the course of a nuclear emergency response exercise would be uninterpretable or confusing for the population, and it would lead to panic and lower their sense of security. The application is an active system, which has been in operation for years, sending several notification messages per day to members of the public on fires, road accidents, weather events etc., and the testing, evaluation and development of the system is part of the normal operation.	
82	Slovakia	Article 16.1	p. 84	With regard to Hungary's annual training and exercise plan, please inform about the respective numbers of the various types of exercises performed annually.	National level nuclear emergency exercises performed annually: Monthly notification exercise, announced in advance, for all organizations involved in the emergency response system. Notification exercise, not announced in advance, 3 per year, for all organizations involved in the emergency response system. Notification and communication exercise, once per year, for all governmental organizations may be involved in case of emergency. 1 national command post exercise connecting to one of the NPP command post exercise. 1 national communication exercise connecting to the other NPP command post exercise. Furthermore: - Hungary regularly joins international exercises, - the organisations can organize different exercises for their own level.	

83	Ukraine	Article 16.1	pages 82-83, Sec. 16.1.3, 16.1.4	Please provide information on criteria for measures for public protection (for example, for iodine prophylaxis and evacuation).	The criteria for protective actions in case of an emergency situation are based on the old EU BSS, and expressed in avertable doses. This system is under revision to be in line with the new international requirements (Council Directive 2013/59/Euratom, IAEA GSR Part 7).	
84	Ukraine	Article 16.1	page 82	What methodology is used for assessment of critical problems (threats) in the National System of emergency preparedness for nuclear accidents?	Hungary uses the IAEA approach for hazard assessment. The facilities and activities are categorized to Emergency Planning Categories.	
85	Croatia	Article 16.2	16.2.2, 88	What is the position of the HAEA concerning the HERCA/WENRA approach for a better cross-border coordination of protective actions during the early phase of a nuclear accident? Have all the preconditions been met to implement this approach within the emergency response? Are there any plans	As part of the implementation and transposition of the Council Directive 2013/59/Euratom, the way of harmonization of the intervention levels with the neighbouring countries should be incorporated in the national legal framework until the end of 2017. Having done that, the bilateral agreements with the neighbouring countries may be modified. The EU is developing an “implementation guideline” of the Council Directive 2013/59/Euratom for nuclear emergency management as well, in which the HERCA /WENRA approach will be considered.	

				for the cooperation with the neighboring countries in the preparedness phase?		
86	Norway	Article 16.2	85	What is your experience on communication with the public?	In the last four years there were not any INES Scale events in Hungary, only below level 0. It means that responsible organisations did not have any direct communication with the public because of a real emergency situation. During emergency exercises, communication tools and channels are tested, but to avoid panic, population in the vicinity is not involved. After each exercise HAEA publishes news about it on its website. The regulation of communcation with the public is reviewed based on the requirements of the new EU BSS and on one suggestion of the IAEA EPREV mission to Hungary (2016) relevant to the multilanguage information in case of emergency.	
87	Austria	Article 17	Section 17.1.2, p90	Could you please explain what the “regulated screening level” is, and whether it is the same for all events or takes into account special characteristics of an event and its possible impact onto the plant?	During site survey and site assessment of nuclear facilities, the potentially hazardous activities pursued in the environment of the site shall be assessed. The Nuclear Safety Code prescribes that if structures or engineering measures are required to ensure protection against the effect of human-made external events, the characteristics, necessary for the determination of the parameters to be included in the design basis, shall be identified for a recurrence interval of 10e-4 to 10e-7/year. So the “regulated screening level” mentioned in Section 17.1.2, p90 of the National Report is 10e-7/year for external hazard factors of human origin.	
24	United States of America	Article 17	Section 17.1.2, pg 90	The report indicates that the probability of an aircraft crash at the plant is minimal due to the lack of nearby airports. Has a review been done to consider, and take	The observation of the prohibited fly zone around the power plant is the duty of the Hungarian Defence Forces (HDF). Since January 2017, there is a direct telephone line between the HDF military air traffic control and the Paks Nuclear Power Plant, which helps with the early warning of an intentional harm of the prohibited zone.	

				actions if necessary to mitigate, the effects of a possible intentional crash?		
89	Norway	Article 18.2	page 92	Are there any recent incidents which has led to some operational experience feedback?	Yes, in case of some minor issues. Mainly events that higlighted the shortcomings of procedures and resulted in their further development.	
90	Norway	Article 19.1	page 94	2 questions follow 1. Related to frequency of a large radioactive release. The estimated probability of PSA level 2 results is not shown in the report. Can you please comment? 2. How are human errors considered in the PSA?	1. The latest level 2 PSA results of Unit 3 is 2,74·10-6/year for LRF which fulfils the LRF < 10-5/year criterion. Before the PSA calculations were made, it was analyzed and indicated that the differences between the units would cause insignificant differences in the level 2 PSA results compared to the uncertainties of the input data, therefore the level 2 PSA were only made for Unit 3 as a reference unit for Unit 1, 2 and 4. It means that the level 2 PSA results of Unit 3 are considered valid for Unit 1, 2 and 4 as well. 2. According to the international recommendations, the PSA model considers three types of human error in the calculations: Type A: Human actions before the initiating event during normal operation that degrade system availability Type B: Human errors that cause or contribute to initiating events, Type C: Human errors occurred after the initiating event and during the recovery actions e.g.: Inadequate recognition of the situation or the selection of the wrong strategy or the operator fails to recognize the previous error he made during the transient or the operating personnel fail to perform certain recovery actions. The data used in our probabilistic calculations are from data which is collected from international reports and statistics with correction with data from operational experiences, interviews, procedures and guideline reviews. For type C human errors the data was provided through a comprehensive data collection from the simulator facility experiencies of the Paks NPP.	

91	South Africa	Article 19.1	Page 99 19.6.1	How is the effectiveness of maintenance determined?, ie is there special indicators that is looked at?	MVM Paks NPP Maintenance Rule application is based on the international best practice, the US regulation 10CFR50.65: Requirements for monitoring the effectiveness of maintenance at nuclear power plants. For system level monitoring Paks NPP uses performance indicators: system reliability and system unavailability; for equipment level performance monitoring Paks NPP implements the ASME OM code (valves, pumps, diesel generators).	
92	Ukraine	Article 19.6	pages 99 - 101	Is information on operational events at NPPs and research reactors, including investigation of these events, accessible to the public? Is relevant information accessible on the regulatory body website?	Information on operational events at NPPs and research reactors is published on HAEA's website (if it is necessary, in English as well). News is published even about minor incidents – such as below INES scale events (e.g. unplanned capacity reducement of a unit). Results of investigations are available in the annual report for the Government and the Parliament on the safe use of atomic energy. The adopted report is available on HAEA's website. HAEA has made the most important operational indicators of the Paks Nuclear Power Plant and the Budapest Research Reactor available on its website. The real-time radiation data delivered by measuring stations in the vicinity of the power plant are also made public. No INES-1 or higher level event took place in the last four years (since 2013). To inform the international public, HAEA publishes its Bulletin in English about the recent developments in nuclear safety in Hungary every six months. It also includes information about anomalies, incidents and events.	
93	Lithuania	Article 19.7	Page 101	In accordance with IAEA GSR Part 1 "Governmental, Legal and Regulatory Framework for safety" (Requirement 15) „The regulatory body shall make arrangements for analysis to be carried	HAEA is continuously collecting and evaluating international experience. The management system of HAEA has specific internal procedures for these activities, which includes for example: - Regular information exchange with foreign regulatory bodies (e.g. STUK, Gosatomnadzor, Rostechnadzor, etc.); - Participation in international initiatives for experience evaluation and exchange (e.g. EU Clearing House, OECD NEA Multinational Design Evaluation Programme, etc.); - Continuous monitoring of international event reporting databases (e.g. IRS [IAEA], ConEx [OECD NEA], etc.). The HAEA, as a regulatory body, ensures experience feedback by keeping the legally	

				out to identify lessons to be learned from regulatory experience, including experience in other States ...". Could you please explain the arrangements at HAEA made to identify and evaluate regulatory experience of other States, relevant to evaluation of new NPP design in particular, if the Finish regulatory experience on AES-2006 design review was used to enhance the safety features of new NPP to be constructed? Please provide examples of made improvements.	binding requirements at state-of-the-art level. In that endeavor, international experience plays the most important role. For instance, during the development of design requirements, the nuclear safety regulations of Finland, the UK and the USA were scrutinized to look for good practices. The HAEA also strives to incorporate useful international experience into its regulatory practices, a good example is vendor inspection which is planned by the HAEA.	
94	Ukraine	Article 19.7	page 100	The report provides brief information of operating experience feedback. Are any criteria used to assess effectiveness of this activity?	There are some elements of operating experience feedback where trend observation and/or some criteria are used to monitor the activities. For example: number of significant events, number of reportable events, number of SCRAMs, number of corrective actions, delay in corrective actions, recurrent events, etc. HAEA does not use any criteria to assess effectiveness of OpEx feedback, but this is an aspect during inspections. A comprehensive inspection was carried out in the Paks NPP in 2016: one of the main areas covered was operational experience feedback.	