



## HUNGARIAN ATOMIC ENERGY AUTHORITY

### *Nuclear Safety Bulletin*

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## RECENT DEVELOPMENTS IN NUCLEAR SAFETY IN HUNGARY

### April 2016

### General

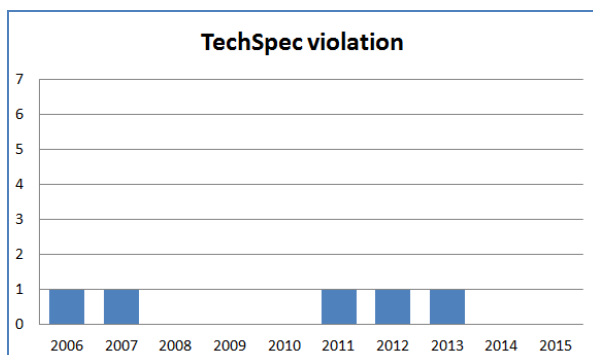
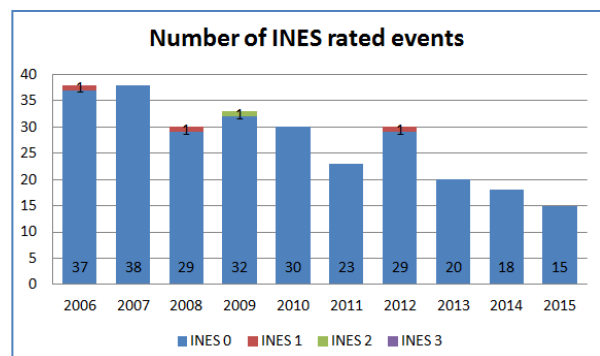
#### *2015 Safety Performance Assessment of nuclear facilities*

The HAEA regularly evaluates the safety performance of the operators of nuclear facilities. The main sources of data for the assessment are the regular reports and the event reports of the licensees, the protocols of regulatory inspections including the regular and comprehensive inspections focusing on specific areas, and the reactive inspections. Hungarian nuclear facilities operated safely and there was no danger to the environment, public or to the employees.

Below a short extract from the forthcoming 2015 safety performance assessment can be observed. The radioactive release data are still preliminary.

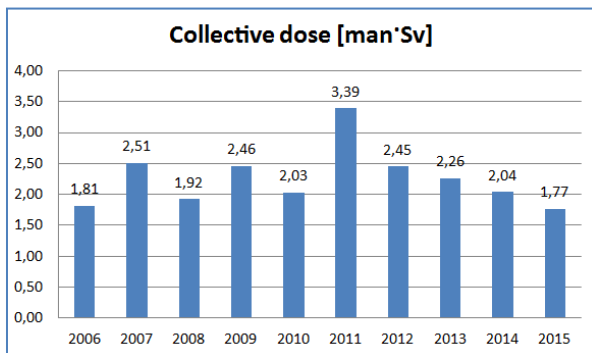
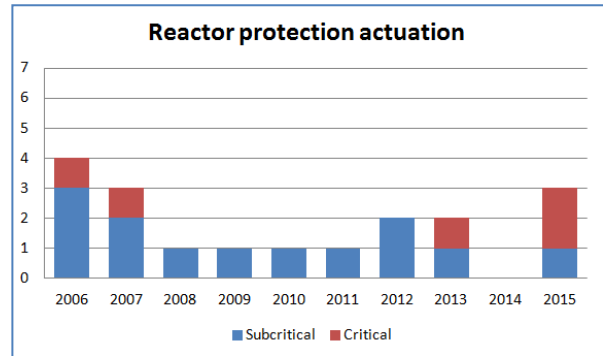
#### *Paks Nuclear Power Plant*

Fifteen events have been reported by the NPP altogether, all of them were of category “below scale” corresponding to Level-0 on the seven-level International Nuclear Event Scale (INES).



There was no technical specification violation in 2015.

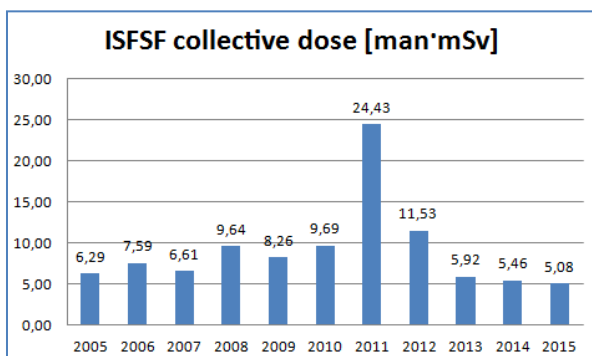
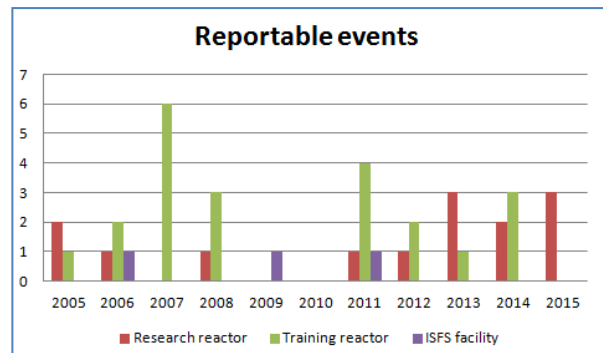
Two RP actuations occurred in the critical state: one due to a shortcut in a power supply connected to the emergency shutdown system; the other also due to a shortcut, during reparation of a temperature measurement circuit. One RP actuation occurred in the subcritical state, due to inappropriate testing of an erroneous scram pushbutton.



The collective radiation dose of employees is gradually decreasing since 2011. The collective dose of 2015 is the lowest value of the last ten years. The liquid and gaseous radioactive releases into the environment were also very small, 0.233% and 0.071% of the regulatory limit, respectively.

### Other Nuclear Facilities

In recent years, the number of reportable events is typically between 0 and 4 at the Budapest Research Reactor, the Training Reactor of the Budapest University of Technology and Economics and the Interim Spent Fuel Storage Facility. The Training Reactor's emergent value in 2007 is related to the aging of the control rod drive unit that has been since replaced.



Following the 2011 year's peak, the collective doses of the Interim Spent Fuel Storage Facility are gradually decreasing. The unusually high value in 2011 was caused by some maintenance activities involving higher exposure. The 2015 year's value is the lowest collective dose of the last 10 years.

The general evaluation of nuclear safety condition of nuclear facilities has showed acceptable and stable safety performance results in 2015.

## **HAEA internal affairs**

### ***Review of the Paks II Preliminary Safety Information Report***

Relating to the planned Paks reactors, the MVM Paks II Ltd. submitted the Preliminary Safety Information Report (PSIR) to the HAEA. The experts of the HAEA are processing the nearly 10000-page documentation based on an 11-month-long work program. The legal basis for the submission and review of the PSIR is ensured by the Act CXVI of 1996 on Atomic Energy. Accordingly, prior to the planned launching of the construction licensing procedure of a nuclear facility, the licensee can submit a PSIR to inform the atomic energy oversight organization.

The purpose of the PSIR in the case of a nuclear power plant is to provide appropriate scope of preparatory information to the nuclear safety authority in relation to preliminary compliance of the planned nuclear power plant with the nuclear safety requirements.

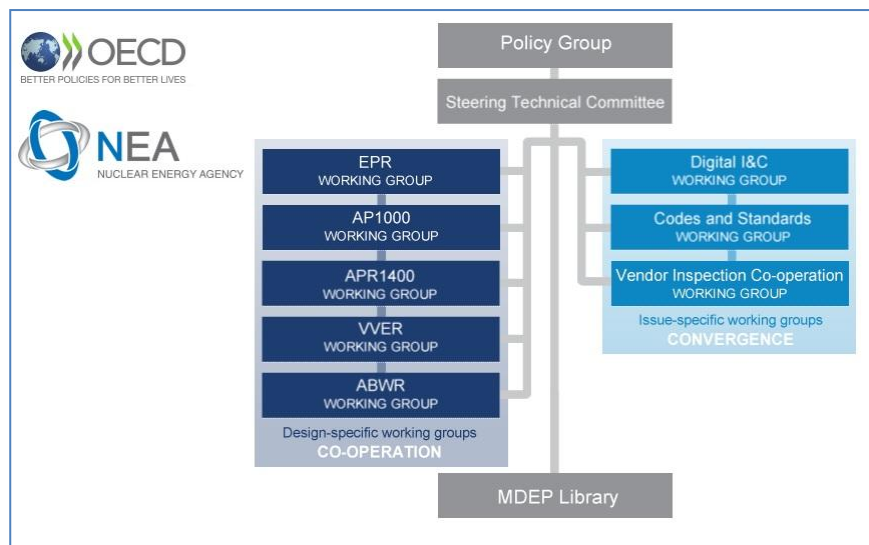
In the PSIR, with regard to the type of the unit, the compliance with and deviations from the nuclear safety requirements and the deviations of the unit type from its original design shall be described. Technical data and analyses available at the time of submission from the preliminary safety analysis report of a unit operating or being constructed that is of the same type as the planned unit shall be used and described for that purpose.

The submitted PSIR is general in nature, it does not contain the site specific design solutions of the new NPP. The licensee, at the earliest within 12 months following the submission of the preliminary safety information may submit the application for a construction license, to ensure sufficient time to the regulatory body to process the information material. The administration deadline in the case of construction licensing is 12 months which can be extended with 3 months.

The review of the PSIR is not a regulatory proceeding. Basically it aims to informing the regulatory body with the main technical parameters and approaches of the planned reactor type, assessing the compliance with the legal requirements and to preparing for the evaluation of the construction license application.

## ***The Hungarian Atomic Energy Authority's membership application to MDEP was accepted***

The Hungarian Atomic Energy Authority applied for membership to MDEP back in 2014, in order to prepare for the licensing of new NPP units in Hungary. The HAEA obtained full membership after approval of the application.



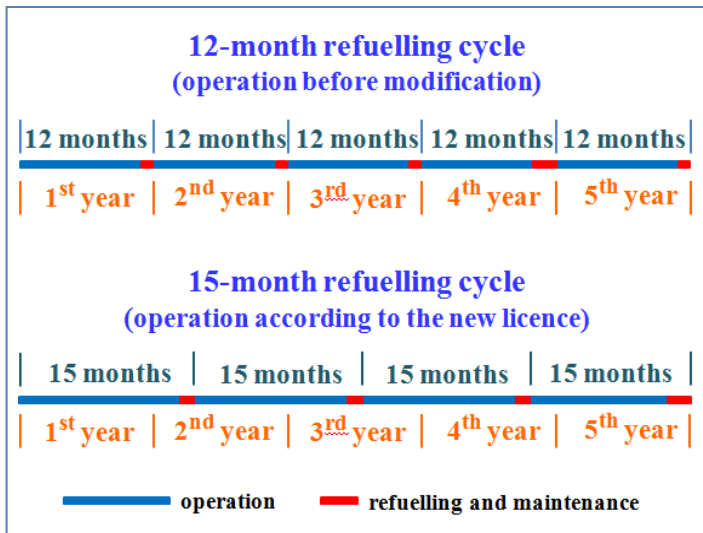
The Multinational Design Evaluation Programme (MDEP) was established by OECD NEA as a multinational initiative to develop innovative approaches to leverage the resources and knowledge of the national regulatory authorities who are currently or will be tasked with the review of new reactor power plant designs. Within the MDEP, there are several working groups for different reactor technologies. One of them is the VVER working group with members from India, Finland, Turkey and the Russian Federation. The VVER WG's main objectives are to leverage resources and ensure that the VVER design reviews remain safety-focused, and to exchange information about their safety reviews of new NPPs with VVER technology. Hungary has plans to build two new units at the Paks site, using Russian designed, VVER-1200 plants. The goal of HAEA's membership in MDEP is to exchange information in order to prepare for the licensing of the new units.

For more information please see [MDEP's website](#).

## **Paks Nuclear Power Plant**

### ***Introduction of 15-month refuelling cycle at the Paks NPP***

Taking into account the international trends Paks NPP has analysed the possibility to extend the refuelling interval. As a part of the analysis the licensee has assessed the technical and nuclear safety impacts of the refuelling cycle extension. In November 2014 based on the results of the performed analysis Paks NPP submitted a license application for the respective modifications.



Utilisation of a new type fuel assembly with higher, in average 4.7% enrichment is necessary to the realisation of the 15-month refuelling cycle.

The introduction of the 15-month cycle has several benefits to both the nuclear power plant and the Hungarian economy, including, most importantly, improvements to safety. It reduces the volume of outage-

related work, the total occupational exposure of NPP personnel, and the number of failures due to maintenance risks. Over the entire lifetime of the plant, the number of unit shutdowns and restarts will be lower, which has a positive impact on nuclear safety and the durability of plant systems and components. In addition, the 15-month refuelling interval and the application of fuel assemblies of higher enrichment reduces the quantity of used fuel and the volume of low- and medium-level radioactive waste produced during maintenance work. Less amounts of spent fuel reduce the need for temporary storage and disposal capacity and thus the environmental impact as well.

The Environmental Inspectorate of the South-trans-Danubian Region (Currently: Department for Environmental protection of the Baranya County Government Office) took part in the licensing procedure as co-authority.

The HAEA asked for additional information and documents several times during the review and evaluation of the application and its supporting documents. Finally the HAEA concluded that the documents submitted in the areas of safety analysis, strength- and service life calculations, aging management, maintenance, chemistry, waste management, radiation protection, operation, emergency response, operational documents meet the nuclear safety requirements as stipulated in the current legislation.

The HAEA in accordance with Section 11/A of the Act CXVI of 1996 on Atomic Energy held a public hearing in the Hall of the Mayor's Office in Paks on June 23, 2015. During the public hearing no questions or comments were taken, so the public hearing did not reveal any facts or information which would have precluded the granting of the license.



The HAEA issued the license to introduce the 15-month refuelling cycle on December 1, 2015. The HAEA's decision contains a set of conditions for the licensed operating modification, including those prescribed by the environmental authority. For example:

- The 15-month refuelling interval shall be introduced at all four Paks units before the end of October, 2016;
- The inspections and tests of the safety class valves shall be performed in accordance with MSZ 27020 standard requirements from the 2016 refuelling outage of Unit 2;
- All safety class valves shall be included in the scope of the maintenance effectiveness monitoring;
- The general operating license of each unit shall be renewed accordingly in a separate procedure.

### ***Paks NPP submitted the SLE (Service Life Extension) application of Unit 3***

In December 2015 - in accordance with the legal regulations - one year before the expiry of the original design service life the Paks NPP submitted the SLE license application of Unit 3. The application summarizes the results of previous activities to demonstrate the further operability of the unit. The application describes that the Paks NPP has implemented the tasks planned in the framework of the service life extension programme, and the results of the tests and their analysis demonstrating that Unit 3 can be operated till the 31st of December, 2036.



The HAEA has launched the licensing process, began the review and assessment of the documentation and took the preliminary procedural steps (such as notifying customers, preparations for public hearing, involvement of special authorities, etc.), in compliance with the legislation in force.

The licensing process is expected to be finished in December 2016.



## Radioactive Waste Repositories

### *The operating status of RWTDF restored*

In December 2013, during radioactive waste processing, an incident occurred in the Püspökszilágy Radioactive Waste Treatment and Disposal Facility (RWTDF), resulting in a surface contamination greater than the control level in the operations building.

Following the incident, the license of the RWTDF was withdrawn for conditioning the received wastes and for the operation of waste processing systems. For this reason, the delivered, institutional radioactive waste was placed in an interim storage facility.

After fulfilling the requirements for the operational license related to waste conditioning and final disposal (modification of the ventilation system and the sorting box, development of radiation monitoring systems), the Public Limited Company for Radioactive Waste Management (PURAM) as the licensee requested the operating status to be restored.

This license is required for the safe processing and conditioning of the institutional (non-NPP origin) low- and intermediate radioactive waste generated in Hungary.

The license also containing the provisions from special authorities was issued by the HAEA at the end of 2015, allowing the PURAM to manage and process the received radioactive waste.



## Emergency Preparedness and Response

### *HAEA joined the INEX-5 international nuclear emergency response exercise*

The OECD Nuclear Energy Agency (NEA) has been developing international nuclear emergency response exercises called INEX since 1993. The latest in the series, the INEX 5, was an exercise on notification, communication and interfaces related to catastrophic events involving radiation or radiological materials. The exercise – because of its goal – was organized regionally, to provide basis for enhancing national emergency management arrangements, as well as international.

On March 16, 2016 an INEX 5 exercise took place with the participation of Slovenia, Croatia, Italy, Austria and Hungary based on the scenario of a severe sleet happened in Slovenia, causing a critical situation in the country, threatening the Krsko Nuclear Power Plant. Beside

the organs of the Directorate General for National Disaster Management, the HAEA Emergency Response Organization was also activated: our experts helped the decision makers by providing analysis and proposals.

The main goals of Hungary – which were in line with the OECD NEA INEX 5 exercise objectives – were to test and identify elements for improving national arrangements for notification, communication and interfaces related to catastrophic events involving radiation or radiological materials, and to exchange experience with other participating countries. To meet these goals, the following common key objectives have been set:

- Test and investigate the adequacy of national arrangements (including national coordination and communication), and where appropriate international arrangements for notification, communication and obtaining and managing international resource support to respond to a severe contamination event;
- Review and share information on approaches to notification and communication processes in order to identify good practice and to allow review and improvement of local, national and international arrangements;
- Identify key areas and approaches to international coordination and communication in order to provide a basis for improvements in international emergency management systems.



The exercise was completed professionally, it has proven that the flow of information was smooth and the communication on national and international level worked well. Report about the lessons learnt is going to be sent to the OECD NEA.

### ***Forthcoming EPREV Mission to Hungary***

In June 2016, the IAEA will conduct an Emergency Preparedness Review (EPREV) mission to Hungary over a two weeks period. The objective of the mission is to provide an assessment of the State's capability to respond to nuclear and radiological incidents and emergencies. During the mission 11 site visits and nearly 30 interviews with representatives of the organizations involved are planned. Beside the HAEA the National Directorate General for Disaster Management gets a prominent role in the program.



Hungary requested the EPREV mission in 2014. The Pre-EPREV mission was conducted in 2015.

The review will be conducted by comparing the Hungarian arrangements with the General Safety Requirement (GSR) Part 7, Preparedness and Response for a Nuclear or Radiological Emergency. The main goal of the international review is to improve the national arrangements to respond to a nuclear or radiological emergency. We believe that this independent assessment would give a particular positive message on our measures taken after the Fukushima accident on our efforts to enhance opportunities to avoid and manage severe accidents initiated by extreme situations.

Preparations for the mission are in the final stage in close cooperation with the review team.