

**Declaration and answers of MVM Paks II. Zrt
to the contents of the annexes attached to the position statement made by the Ministry
of Environment of the Slovak Republic**

Our declaration and the answers are provided inserted in italics into the original document received at the passages where you expected replies to the issues you raised. The authors of the original documents – i.e. the respective authorities or offices – were identified by their names and a serial number before each of the documents.

1. District Office of Žilina (Zsolna), Environmental Department, Unit for Public Administration of Water Management and Priority District Issues of Environmental Elements

The proposed activity is the establishment and operation of two nuclear power plant units with an output capacity of net 1000 – 1600 MW for generating electric power for public purposes in the territory of Hungary. The preparatory phase is planned to last for a period of 5 or 6 years, with an additional 6 years dedicated for the implementation phase. The first unit of the nuclear power plant would start operation before 2025 and the second one before 2030. Construction and operation of the new nuclear power plant units is subject to the scope of the Espoo Convention on Environmental Impact Assessment in a Transboundary Context. With respect to the new nuclear power plant units, radiological environmental impact with transboundary implications may be involved.

In the course of the nuclear power plant operation mainly gaseous and liquid emissions need to be considered. From the point of view of radiological considerations the geographic extension of the impact area is stated to remain within the controlled zone under normal operation both in terms of gaseous and liquid releases and direct or diffuse radiation contamination doses.

From the perspective of the establishment of new nuclear power plant units the plant site at Paks is characterised by a number of favourable conditions, to be exploited fully in case the power plant is constructed. For instance, it is an already existing nuclear industrial plant area and thanks to substantial investment efforts seen in the past years a number of additional safety and environmental assessment and investigation projects were conducted on the site. Under normal operation the radiological impact area remains within the controlled zone both in terms of gaseous and liquid releases and radiation doses alike.

Based on the the documents received and the aforementioned considerations the District Office of Žilina, Environmental Department, Unit for Public Administration of Water Management and Priority District Issues Of Environmental Elements **has no further comments.**

2. Municipality District of Bratislava (Pozsony)

Pursuant to its powers Bratislava Municipality District issues the following regional development and environmental position statement:

Since the most hazardous types of risks in terms of transboundary impacts include radiation discharged in the case of accidents, earthquakes or floods, please consider in your position statement the following:

- the nuclear safety to be implemented during both the construction and operation of the nuclear power plant by full and stringent compliance with all international conventions and laws and regulations, mainly through preventive measures in order to avoid Slovakia being exposed to radiation hazard
- *In the course of the preparation of the Environmental Impact Study investigations were extended to all elements of the environment –required by legislation – and detailed migration studies were conducted and the expected additional doses for the population of neighbouring countries were determined for the cases of design basis accidents and design extension conditions. The outcome of the investigations are contained in Chapters 20, 21 and in the International Chapter of the EIS. Based on this document the accumulated radiological impacts across the border will remain within the dose restriction levels (taking into account all relevant isotopes, including iodine and caesium too) defined by the authority even in the case of releases caused by beyond design basis accidents, in other words the impact is neutral.*
- *Compliance with the nuclear safety principles in effect from time to time shall be demonstrated in the establishment licensing procedures to be conducted by the National Nuclear Energy Agency. In accordance with the design principles, the nuclear power plant shall be made prepared to manage all and any design basis accidents. In the case of the new III+ generation units, at the time of occurrence of complex sequences and events leading to the meltdown of the reactor zone the design extension condition ensures under the Hungarian regulations (and in line with the international recommendations) that early and/or large scale releases could be practically excluded.*
- **a solution** for a permanent site to deposit spent fuel (spent fuel elements are temporarily in the fuel pool for a period of 3 to 5 years before transferring them to the Interim Storage of Spent Nuclear Fuel (ISSNF or KKÁT in Hungarian) which is found in the neighbourhood of Paks Nuclear Power Plant.
- *Handling and storage of the spent fuel elements was presented in Chapter 19 of the EIS. After their use in the reactor, spent fuel elements are stored in the fuel pool situated close to the reactor pending on the process technology for a period of 3 or 5 years (maximum 10 years), and subsequently this is followed by*

an interim storage period. Their final deposit may be implemented pursuant to the national policy and programme determined on the basis of the Decision of the Parliament No 21/2015.(V.4.) OGY. This is expected to mean either direct final deposit of the spent fuel assemblies or the final deep geological deposit of waste generated by reprocessing.

- *Pursuant to paragraph (1) Article 40 of Act No CXVI of 1996 on nuclear energy: 'The body designated by the Government makes recommendation to the national policy and national programme concerning the handling and management of spent nuclear fuel and radioactive waste, to the review of such policy and programme, making sure furthermore that the tasks related to the final disposal of radioactive waste, interim storage of nuclear fuel, closing the nuclear fuel cycle, and the decommissioning of the nuclear facility.' To accomplish these tasks, a Public Limited Company for Radioactive Waste Management was set up in 1998, which was transformed to a Limited Liability Company in 2008 (RHK Kft.). According to item bb) Article 2 of Government Decree No 215/2013. (VI.21) RHK Kft. is 'in charge of the tasks related to the establishment and extension of the interim storage facility of spent nuclear fuel'. The interim storage option described in the Environmental Impact Study prepared for the purposes of the capacity maintenance project is limited to the presentation of a potential alternative and a possible location. Actual information on interim storage of the spent nuclear fuel elements and the related technical solutions will be assessed and presented in details in the Environmental Impact Study to be completed under a separate procedure.*
- *This Environmental Impact Study is dedicated to the presentation of the environmental impacts of the nuclear power plant units to be constructed as part of the environmental licensing process. Spent fuel elements originating from the new units will not be placed to the Interim Storage of Spent Nuclear Fuel which is currently operational, there may be a need to establish a new interim storage site. The set up of a new interim storage facility is subject to Environmental Impact Assessment in itself, as stated in Government Decree No 314/2005. (XII. 25.) on the procedure of Environmental Impact Assessment and IPPC the impacts of which have to be demonstrated as part of a separate process. Technical parameters of the storage facility to be implemented will be described in the course of this separate procedure.*
- *As an additional possibility, it may be worth noting that under Article 7 of Act No II of 2014 proclaiming the Convention between the Government of Hungary and the Government of Russia on the cooperation to be carried out in the field of peaceful utilisation of nuclear energy the transport and interim storage of spent assemblies to and in Russia or their reprocessing and the interim storage of residual waste is ensured. Such materials may only get back to the territory of Hungary only subsequently.*

Emergency response arrangements:

With respect to emergency response arrangements the intention must cover the following:

- the monitoring, notification and alarm system – which needs to reach out for the plant employees, the local population in adjacent areas (community, district, zone) and the entire population of the Republic of Hungary, and last but not least the inhabitants of the neighbouring countries.
- *The discharge and environmental monitoring system of the new units was set up in accordance with the provisions laid down in Article 6 of the Discharge Decree No 15/2001 just like in the case of the current units. Samples provide by the remote measuring and sampling systems will be processed and measured in accredited discharge and environmental monitoring laboratories according to Article 6 of the Discharge Decree, incorporating them in their sampling and measurement programmes.*
- *Additional relevant information can also be found in Chapter 20 of the Environmental Impact Study.*
- *According to the Hungarian legislation – in case of a significant environmental impact – not the operator of the power plant but the National Emergency Response System provides decisions and implements protection measures. This method complies with international recommendations, because the principle of defense in depth – in case of an event which has a significant impact out of the boundary of the site – the use of the emergency response plans should assure the protection of the population against health damage.*

Having regard to the facts referred to above and the specific professional contents of the relevant issues concerned, we find the cooperation with the public administration body on nuclear energy supervision and nuclear safety of the Slovak Republic, the Nuclear Energy Supervision of the Slovak Republic and the public health authority in charge for the radiological protection of the Slovak Republic and full consideration of their standpoints of utmost importance.

The Bratislava Municipality District requests to insert the findings and observations set forth above into the assessment documentation of the transboundary environmental effects of the activity entitled “The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site”.

3. Ministry for Transportation, Building and Regional Development of the Slovak Republic (hereinafter referred to as the “Slovak KÉRFM”), Section for European Union Affairs and Foreign Relations, Transportation Infrastructure Development Department, Transportation Modelling and Infrastructure Unit

The establishment of the new units in Paks Nuclear Power Plant II will take place in the proximity of the River Danube. Part 6.3 of the Environmental Impact Study discusses the impacts which the proposed activity may exert on the River Danube. The Slovak KÉRFM requests that the documentation be supplemented with the impacts expected at the outlet of the discharge canal built for the spent cooling water affecting the nautical conditions of inland shipping, since a lateral inflow may be experienced at the location of the water discharge as a consequence. The return of the discharged cooling water has an impact on the flow conditions of the fairway established on the Danube. Consequently, it would be appropriate to indicate the section concerned according to the safety mark laid out in CEVNI (European Code for Inland Waterways).

- *Chapter 11 titled Modelling of the Danube river morphology and Danube heat load of the Environmental Impact Study presents a full scope assessment where figures can also be found on the flow conditions formed at the mouth of the hot water and cold water canals, respectively.*
- *The riverside flow conditions will change to a slight extent in the surrounding of the water extraction and water discharge site on the Danube on the right hand bank of the Danube in the moderate situation expected in the future upon the decrease of the Danube volume rate of flow (1100 and 950 m³/s) (232 m³/s cooling water extraction and hot water discharges, respectively, in 2032). Since however the width of the navigation route is substantial even at low water stages, and the navigation depth is available along the entire ship channel, it seems to be expedient to move away from the river bank a little towards the inner side of the Danube water space which is not influenced any more (maximum approximately 50 m) in order to avoid potentially non desirable drifting. Less intensive shipping traffic is expected at low water stages since further reaches of the Danube can not always be navigated in these periods. The expected riparian flow direction change will diminish from 2032 with the exit of the currently operating units of the power plant, and from 2037 (132 m³/s cooling water extraction and hot water discharges, respectively) will become similar to that experiences at the time being.*
- *The EIS set the calculation of the spatial distribution of the heat plume (its impact area) as the primary goal in order to reveal conditions for compliance with the effective laws and regulations. Negative impacts on navigation may be mitigated and improved with appropriate control actions. It is expedient to avoid the area next to the discharge site where the heat plume enters the river from the hot water channel. Further up impacts are attenuated and the water depth may still be fit for safe navigation.*
- *Please be informed furthermore that under the Ministerial Decree No 17/2002. (III.7.) of the Ministry for the Protection of the Environment and Water Management declaring natural and artificial surface waters fit for navigation or to be rendered fit for navigation as waterways the section of the Danube river (international waterway) between river kilometres 1640 to 1433 is classified in*

waterway class VI/C. The section of the Danube between river kilometres 1560.55 and 1433 belongs to the operational area of ADU-VIZIG. The respective navigation maps can be downloaded from the link below:

<http://www.aduvizig.hu/index.php/koezerdeku/hajozas>

- *Markingout on this section of the Danube is accomplished by the plotting unit of ADU-VIZIG.*

4. Slovak Environmental Protection Agency, Environmentalist and Project Management Section

The activity is classified under Annex No 8 to Act No 24/2006 Z.z. as follows: according to the Annex No 8 of the Act the proposed activity belongs to Section 2.4 'Nuclear power plants and other facilities equipped with nuclear reactors (except experimental equipment with a permanent thermal output of not more than 1 kW used to produce and convert fission and enriched materials), which also includes the decommissioning and the abandonment of such facilities. Nuclear power plants and nuclear reactors do not qualify as such when the radioactive fuel components and other elements contaminated by radioactive radiation had been removed from their sites on a permanent basis. Par 'A' provides for a **mandatory evaluation independent from the limit value** with respect to the proposed activity.

Classification of the activity pursuant to the Convention on Environmental Impact Assessment in a Transboundary Context of the United Nations Economic Commission for Europe (UNECE) (the Espoo Convention): the activity is included in Annex No I thereto: Facilities dedicated exclusively to the purpose of producing, enriching or storing nuclear fuel.

Designer, developer of the study: the main designer of the activity is Lévai Project Hungary. The documentation has been developed by ÖKO Zrt.

The purpose of the evaluated activity is the establishment of new VVER-type nuclear power plant units in the territory of Hungary within the plant site of the existing Paks Nuclear Power Plant. Thermal output of the reactor is 3200 MWe, gross electrical output is 1200 MWe, the district heating capacity ranges up to 300 MWe.

Paks Nuclear Power Plant takes a key role in the Hungarian power supply system. Its four units were commissioned between 1982 and 1987 and they all are pressurised water, water cooled and moderated V-123 type VVER-440 reactor units. Original rated output of each unit was 440 MWe. This parameter was raised to a level of 500 MWe as a result of the performance enhancement project and this lead to the increase of the overall nominal capacity of the Paks Nuclear Power Plant to 2000 MWe. Thermal output of the units each is 1 485 MWt, their overall total thermal output being 5 940 MWt. Paks Nuclear Power Plant operates as a base load power plant with a homogeneous load pattern to the

extent possible. It produced 15 369.6 GWh electric power in 2013 accounting for 50.7% of all electric power generation in Hungary.

Location: The Paks Nuclear Power Plant site is found in county Tolna, approximately 118 kilometres to the south from Budapest. The site lies about 5 kilometres to the south from the city centre of Paks, 1 km to the west from the Danube and 1.5 km to the east from the main public road. The southern national border can be found between 63 to 75 kilometres to the south from the site, 94 km upstream on the river Danube (the existing power plant is at river kilometre 1527, the national border is situated at river kilometre 1433). The new plant site is located in the neighbourhood of the operating Paks Nuclear Power Plant within the plant property boundaries. The size of the entire area is 105.8 ha of which the plant areas and the mobilisation area take 29.5 ha and 76.3 ha, respectively. The two power plant units are situated on the plant area, including the balance of plant systems, the systems, and other buildings, while the construction and assembly base area provides the necessary area for the construction works in the implementation phase.

Starting and completion date of the construction works and the proposed activity: the time required for the construction and completion of the nuclear facility is assumed to be 11 or 12 years, of which 5 or 6 years will be the preparatory phase and an additional 6 years of implementation period is accounted with. The first unit of the plant is intended to be put in operation before 2025, the second before 2030. Designed useful lifetime of the units is 60 years.

Justification of the activity in the area concerned: need for electricity.

Short description of the technical, technological solution applied: based on the preliminary research findings conducted in the preparatory phase preceding the construction of the buildings of the new nuclear power plant units it was clearly proposed to construct a third generation pressurised water nuclear power plant (just like in the original one, (comment by Offi Zrt.(Hungarian Office for Translation and Attastation Ltd)) More than 80% of the new units in progress worldwide belong to this type and the respective workmanship and professional competence acquired in the four operational units of the Paks Nuclear Power Plant over the years exist in Hungary.

Key technical parameters of the VVER-1200 type nuclear power plant units:

Reactor thermal output	3 200 MWe
Net power output (pending on the technology selected for the secondary loop)	1113 MWe
Operational period	60 years
Rated coefficient of performance	>90 %
Annual downtime due to scheduled overhaul	20 days
Self-consumption	7.1 %

Type of fuel to be used	UO ₂
Fuel cycle, the time spent by one fuel assembly in the reactor	54 months(3 x 18 months)
Campaign length	18 months
Fuel requirement	40.58 t UO ₂ / 18 months
Fuel element requirement (fuel + assembly)	56.4 t / 18 months
Number of fresh fuel assemblies upon transfer (equilibrium)	76
Average enrichment level of fresh fuel assemblies	4.95% (235U)
Average burn out in the fuel assembly	47.5 MWdays / kgU
Controllability	between 50% - 100%, maximum 250 / year
Number of loops and main circulation pumps	4.4 FKSZ/MAP
Primary circuit pressure	162 bar
Reactor inlet / outlet temperature	298.2 / 328.9 °C
Steam generator	4, horizontal
Steam generator outlet pressure	62.7 bar
Total volume rate of flow for primary loop cooling medium	86 000 m ³ /h

Safety measures: Nuclear systems of the unit are installed in a double hulled containment. The inner wall ensures airtight closure of the containment while the outer wall protects the hermetic space from external impacts such as the crash of an aircraft. The lower part of the containment functions as a trap for meltdown.

The safety systems with a 100% capacity each are arranged in four independent channels. Power supply for each of these channels is ensured by a diesel powered electric generator unit with a capacity of 7.5 MW.

In case of operating troubles four high pressure hydro-accumulators are also available in addition to the other systems providing cooling to the reactor and the primary loop, which have to keep the active zone under water without operator intervention during the initial period of breakdown events with the loss of a large amount of coolant in the primary loop, until the active systems of the emergency coolers in the zone are able to provide their functions.

Fuel: the proposed fuel for the nuclear power plant units designed for the Paks site is uranium dioxide. Transportation of the fuel to the site will take place mainly on railroad in containers complying with the relevant laws and regulations. The first charge is delivered to the site approximately 1 or 1.5 year earlier than the scheduled commencement of commercial operation. Throughout the 60 years of designed useful lifetime the fresh fuel elements necessary for the replacement (transfer) of the spent fuel will be delivered in a scheduled manner adjusted to the fuel cycle and the transfer date in every 18 months. Fresh fuel corresponding to two transfers per unit will be stored on site as strategic stock.

Spent fuel assemblies are put into the fuel pools following their removal from the reactor where remnant heat removal is ensured until the extent of such heat is reduced to a

level where the spent element is fit for storage in a dry interim storage site. The fuel assembly can not spend more than maximum 10 years in the fuel pools. Following storage in the fuel pool spent fuel elements are put to interim storage.

The power generation process: The proposed new nuclear power plant units can be broken down into two main parts as a function of the power generation process, the primary and the secondary loop.

The primary loop transfers heat generated in the active zone of the reactor into the steam generator, and the steam generated in the steam generator carries out work during its transformation in the turbine of the secondary loop, thus producing electricity in the generator attached to the turbine.

The main function of the secondary loop is to transform the thermal energy produced in the reactor to kinetic energy first and then to electricity.

Feed water flowing in the secondary loop is heated by the primary loop water circulating in the tubes of the heat transfer circuit of the steam generator at a temperature of 300–320 °C.

Steam exiting from the steam generator is put to the turbine where using its kinetic energy drives the rotor of the turbine. Both the high pressure and low pressure housings and the generator rotor are attached to the same shaft in the turbine. Steam pressure is dropped in the high pressure turbine housing and the moisture content increases substantially. Therefore, steam is passing through a so called entrainment separator (drip pipe) and steam overheated device before entering the low pressure steam housing, where water droplets damaging the turbine blades are extracted from it. Discharging steam already carried out work will be put to the condenser unit where cooling water flows in thousands of thin pipes. Steam is condensed at a temperature of about 25 °C on the cooling pipes and through a multi-stage pre-heater used to enhance the efficiency rate, the feeder pumps carry it back to the steam generator. The efficiency rate of the steam cycle is approximately ~37 %. Heat which can not be used for electric power generation is also formed in both the primary and secondary circuits during the power generation activities of the nuclear power plant units which is bled by the cooling systems.

The **cooling systems** of the proposed new nuclear power plant units can be divided into three different main parts:

- The function of the condenser cooling water system is to extract condense heat of the steam circulation process from the condensers situated in the secondary loop of the nuclear power plant units using mechanically filtered Danube water flown through the surface condensers.
- The function of the process technology cooling water system is to distract heat from the auxiliary systems in the secondary loop. In the technological solution applied in the proposed new nuclear power plant units the process cooling water system extracts waste heat from the turbine-generator set, feeder pump and high performance electrical motors through a closed intermediate cooling loop. Process cooling water system branches off from the condenser cooling water loop in the turbine engineering room and warmed up process cooling water is

discharged together with the warmed up condenser cooling water into the Danube.

- The function of the safety cooling water system is to provide coolant for such primary loop equipment of the new nuclear power plant, which require constant cooling during normal primary loop operation.

Human resources requirement: during the operation of a single block 600 employees on the payroll may be reckoned with, consisting of 400 persons in main working hours and 200 persons in multiple shifts. Assuming 5 shifts and a working schedule of 3 shifts per day, 120 persons/ per day of the 200 persons working in shifts are present in addition to those working in the main business hours, which ranges up to 520 people present at the site on a daily basis.

As soon as the second unit is commissioned for commercial operation 800 employees on the payroll will be needed for the operation of the plant, of which 300 people work in shifts and 500 in standard hours on a daytime basis. Assuming 5 shifts and a working schedule of 3 shifts per day, 180 persons/ per day of the 300 persons working in shifts are present in addition to those working in the main business hours, which ranges up to 680 people present at the site on a daily basis.

Operator staff numbers do not include maintenance crew members, having regard to the fact that a substantial percentage of such functions are outsourced in the present practices.

Adjustment of electrical output: the electric output of the new nuclear power plant units will be controllable between 50 and 100 per cent, allowing operation in both load following and stand alone operating modes. Load change speed of units up and down is 5%/minute (60 MW/minute). Expected availability of the new nuclear power plant units will be >90 %, including annual small maintenance operations and the time required for the transfer of spent fuel. Overhaul is expected in every 10 years with a time requirement of approximately one month. The time requirement for annual maintenance operations is 20 calendar days (fuel transfer and small repair works), while the expected downtime associated with overhauls is 30 calendar days (heavy duty maintenance works on both secondary and primary loops).

The Slovak party received information on the evaluated activity through the Preliminary consultation documentation and sent in its comments, as well as additional questions for which the detailed answer could be found in the international chapter of the Environmental Impact Study and the Evaluation report.

Comments and recommendations

- The key impacts arising from the construction, operation and decommissioning of the nuclear power plant were identified as the effects of '**radiological**' impacts originating from liquid radioactive discharges and the impacts of air pollution.
 - Effects originating from liquid radioactive discharges were most significant in the population age group of 1 or 2 years old children and the adult population cohort

living next to the Serbian border, which are still substantially lower than the dose restriction levels in effect.

- Modelling of the migration of radioactive airborne air pollutants emitted from the new nuclear power plant units proposed for the Paks site were also carried out for the territory of the neighbouring countries using the TREX Euler model on a regular grid covering Central Europe, using the hourly meteorological database from the year of 2011. During the calculations the integrated activity concentration fields and inhalation (originating from breathing) doses were determined. Releases happen from two sources, the 100 m high smokestack and the lower discharge point (35 m). Calculations demonstrated that radiological impacts in the surrounding of the national border did not reach the dose restriction levels established by the regulator authorities even in the case of releases under design extension conditions.
- **‘Non-radiological’** impacts in the establishment phase:
 - impacts on the quality of the atmosphere and the micro-climate are local in their nature,
 - impacts on the surface waters arising from process and technology water extraction, discharge of water generated from dewatering during construction, rainwater discharge, discharge of treated communal and industrial waste water, installation of a pumping station to provide water supply to the cooling water canal, construction of the new section on the hot water canal and the set up of the protective dam all represent local effects,
 - impacts associated with the preparation and levelling of the ground, relocation of public utility network lines, operations involving the generation of dust, erosion of work pit walls, impacts on the soil and geological environment are all local in their nature,
 - impacts on the ecosystems and living communities are local in their nature,
 - noise exposure and vibration exposure caused by construction industry activities as well as by personal and heavy duty traffic are all local in their nature,
 - waste generation and removal, impacts on the population are all local in their nature,
 - impacts on the environment and landscape, the use of the land are all local in their nature.
- **‘Non-radiological impacts’** during the operating period:
 - impacts on the quality of the atmosphere arising from diesel electric generator testing and operation (impact area is approximately 500 m), and from personal and freight traffic (impact area is approximately 50-100 m from the transport route),
 - impacts on the micro-climate mainly through the operation of the cooling system (*like in the original, comment by Offi Zrt.*) (the extension of the impact area associated with the hot water canals a couple of 10 kilometres downstream in the riparian area and 4-5 kilometres upstream from the outlet point),

- impacts on the aquatic environment in surface waters, associated with the extraction of cooling water, discharge of warmed up cooling water (the impact area is 4.5 km in the case of a unit output of 2 x 1200 MW, and 8.5 kilometres in the case of a unit output of 2 x 1600 MW), other process water extraction (local impact area), treated waste water discharge (impact is felt approximately 100 metres from the place of discharge),
 - impacts exerted on surface waters and the groundwater in connection with the construction of the deep lying foundations, the impact of river bed contamination on bank filtrated wells and drinking water supply (impact area is approximately 5 km from the Csámpa water works site),
 - impacts on the soil and geological micro-environment, impacts on the subsoil (local impact area), vibration impacts under the turbine base (local impact area),
 - impacts on terrestrial ecosystems and communities are mostly indirect, the direct surrounding of the new electric power transmission line may be seen as direct impact area,
 - impacts on the aquatic ecosystems, their anticipated impact area is approximately 2.5 km from the mouth of the existing hot water canal,
 - *(like in the original, comment by Offi Zrt.)* noise exposure and vibration exposure related to the noise during operation of plant equipment (anticipated impact area being approximately 500 m measured from the point of emission), impact of noise exposure arising from personal and freight traffic (extending to approximately 50 m from the middle of the road),
 - vibration exposure arising from freight and personal traffic during operation of the units (the impact area is associated with an approximately 100 metres wide zone around the site and the site itself, as well as with the 80-100 metres zone measured from the above ground transport routes),
 - impacts associated with non-radioactive waste generation and the generation of waste during the construction works: direct impact area is the collection point within the site, and the impacts related to disposal, processing, recycling and storage, etc. which are determined during the assessment of the impacts of the equipment concerned,
 - impacts on the surrounding of the settlements: direct impact associated with the city of Paks, indirect positive social and economic impact is related to the entire area of the county,
 - landscape and land use, landscape impacts are concerned within an approximately 20 kilometres range of the power plant and eventual new investment projects related to the establishment of the new power plant.
- ‘Non radiological’ impacts associated with potential operating troubles, accidents and emergency cases
 - impacts on the quality of the air in case of fire and explosion (anticipated events: ignition of oil in case the oil system of the transformer fails, breakdown of gas

cylinders, fire in a space used for the purposes of storing hazardous and industrial waste, etc.) estimated impact area: 1-3 km,

- impacts on the environment of surface waters, soil and geological environment such as leakage of diesel fuel from diesel generator tanks (estimated impact area is approximately 20 km in case of surface waters contamination, subject to the amount leaked and the features of the environment in case of the geological environment and the soil, but it is local.

Conclusion

The complex assessment of the environmental impacts included in the Evaluation report did not demonstrate any substantial transboundary effects on the Slovak Republic in the establishment or operation phase, whether or not potential incidents, accidents and emergency cases were included. The **implementation of the proposed activity is recommended** provided all described elimination actions are strictly and consistently observed and simultaneously monitoring is carried out.

5. Municipality District of Trnava (Nagyszombat), Economic Strategic Section, Spatial Development and Environmental Protection Department

The documentation sent provides information about the establishment of two new nuclear power plant units (Paks II) at the site of the existing Paks Nuclear Power Plant. The Paks Nuclear Power Plant site is situated in county Tolna, approximately 118 kilometres to the south from Budapest, about 5 kilometres to the south from the city centre of Paks, 1 km to the west from the Danube. The proposed nuclear power plant will run by the use of two Russian nuclear units of the type VVER – 1200, with an electric output of 2x 1200 MWe, and thermal output of 2x 3200 MWt.

Having regard to the fact that the establishment and operation of nuclear power plants is subject to compliance with very strict international conventions, provisions of laws and regulations, stringent control, monitoring and safety measures, **we have no comments** with respect to the implementation of this project.

6. Nuclear Regulatory Authority of the Slovak Republic

The Paks Nuclear Power Plant site is situated in county Tolna, about 5 kilometres to the south from the city centre of Paks, approximately 118 kilometres to the south from Budapest, and 118 kilometres to the south from the national border of the Slovak Republic. Based on the documentation made available to us and considering that it was situated in a substantial distance from the national borderline of the Slovak Republic it can be stated that

the transboundary effects of the proposed nuclear facility can only occur in very extreme cases.

The documentation made available to us contains relatively detailed information of technical nature, which allow the assessment of the cross border impacts. Additionally, the documentation made a substantial response to the comments raised by the Slovak Republic on the report developed on the assessment of the environmental and transboundary impacts of the project in question.

In spite of the aforementioned considerations we feel it was indispensable to supplement the information provided in the following fields:

1. The events occurring in Fukushima, Japan repeatedly confirmed the fact that nuclear safety needs constant attention. In this context the European Council stated in March 2011 that 'lessons need to be learnt from these events and all necessary information must be disclosed to the public'. It was also established that 'the highest level requirements of nuclear safety need to be implemented and continuously improved in the European Union and promoted at the international level'. In the documentation made available to us it was included among the requirements related to nuclear safety that the operating units in Paks Nuclear Power Plant complied with the requirements of the stress test and that a National Action Plan was developed on the basis of the recommendations drawn from these stress tests, but it is not documented how such measures were enforced in the Paks II nuclear power plant project. In this context it is suggested that the the environmental impact assessment study confirmed the conclusions drawn from the stress tests (such as the ENSREG document Compilation of recommendations and suggestions), and took account the results of the work carried out by Western European Nuclear Regulators' Association (WENRA) and the current safety standards in place at the International Atomic Energy Agency (IAEA).
- *We fully agree with your observation on taking into account the lessons learnt from the accident at Fukushima.*
- *During the design work of Paks II the experiences gained at Fukushima were taken into account, such as alternative electric power supply and high level protection against external risk factors. The new units involve technical solutions which result in their withstanding to events similar to those which happened in Fukushima.*
- *When designing the new units complying with the official requirements laid down in the Hungarian laws and regulations the Supplier shall perform and meet all 11600 requirements formulated by the Owner, which were compiled – beside Hungarian laws and regulations and international recommendations – on the basis of EU requirements, and they also had to take into account the findings of the stress tests carried out in Paks Nuclear Power Plant as well as the experiences learnt from the Fukushima events. For the purposes of designing*

the new blocks the WENRA and IAEA recommendations also constitute a part of the set of requirements.

- *Functional operation of the active and passive safety equipment of the power plant is the basis of safe operation for all nuclear power plant units. These systems contain technological solutions which make sure that the containment remains intact even in case of complete loss of voltage (complex sequence), or reactor meltdown, thus preventing the escape of any substantial radioactive releases. Certification of compliance with the safety requirements and presentation of safe solutions will be the subject matter of the establishment licensing procedure. At the same time it will be the responsibility of the nuclear safety authority to verify during the licensing procedure whether or not the power plant can be permitted to operate under the conditions included in the environmental permit to be issued in this current procedure.*
- *However, the stress test carried out following the Fukushima accident did not relate to the proposed units but to the units operational at the time of the test. Implementation of the safety reinforcement operations following from the conclusion (such as the installation of mobile diesel electric generators) partly has been completed on the current Units 1 to 4 of Paks and is partly underway.*

2. In the course of characterising radioactivity in the environment the report takes into account the existing interim storage of the spent fuel assemblies stating that it was possible to expand it to receive the spent assemblies from the new units. However the extension project of the interim storage site for spent fuel elements is not developed in further details, for instance with respect to the preliminary safety measures based on which it could be determined whether or not the existing technology in the interim storage of the spent fuel assemblies could be applied for the new type of assemblies.

- *This Environmental Impact Study is dedicated to the presentation of the environmental impacts of the planned nuclear power plant units as part of the environmental licensing process. Spent fuel elements originating from the new units will not be placed to the Interim Storage of Spent Nuclear Fuel which is currently operational, there may be a need to establish a new interim storage site. The set up of a new interim storage facility is subject to Environmental Impact Assessment in itself, as stated in Government Decree No 314/2005. (XII. 25.) on the procedure of Environmental Impact Assessment and IPPC license the impacts of which have to be demonstrated as part of a separate process. Technical parameters of the storage facility to be implemented will be described in the course of this separate procedure.*

3. Chapter 19 of the Environmental Impact Study document deals with the management and elimination of radioactive waste (RW) and spent nuclear fuel

(SNF). The chapter referred to above discusses only the summary of the statutory requirements and the potential options to process RW and SNF. It does not provide for either any more accurate procedure or programme or the impacts thereof on the neighbouring countries.

- *Based on the investigations carried out so far it can be stated that the management of radioactive waste and spent nuclear fuel will have no transboundary effects.*
 - *Chapter 19 of the Environmental Impact Study demonstrates in details how the low and medium level radioactive waste is managed and which possibilities exist for their permanent disposal.*
 - *Under the statutory regulations in place spent nuclear fuel is placed in certified containers during transportation and interim storage which are designed to withstand very severe accidents.*
 - *Decision of the Parliament No 21/2015. (V.4.) on the national policy for management of spent nuclear fuel and radioactive waste provides for the management of spent nuclear fuel and radioactive waste in Hungary. The national programme was developed with a view to this and the issue of final disposal of radioactive waste was also considered here. Based on this the low and medium level radioactive waste originating from the new nuclear power plant units will be deposited for final disposal at the permanent storage already operating in Bataapáti. Costs of disposal will be covered by the nuclear power plant through the Central Nuclear Monetary Fund as it happens in the case of the currently operating units.*
 - *Chapter 19.8 of the Environmental Impact Study contains the concept developed for the purposes of collecting, managing and storing waste classified into various classes generated as a consequence of the operations in Paks II. The generated high level solid waste are packaged and their volume reduced to the extent possible, followed by interim storage in the storage site set up for the purpose until the units are decommissioned or until the high level storage facility is put into operation. Following interim storage high level radioactive waste is handed over to Public Limited Company for Radioactive Waste Management (PURAM, or RHK Kft.) for final disposal.*
4. The study ought to deal with potential transboundary impacts of accidents occurring at all units within the site including the units of Paks II. The national Action Plan developed on the basis of the recommendations from the so called stress tests deals with a potential accident happening in all four existing units of Paks Nuclear Power Plant simultaneously. However, the existing analyses of the transboundary impacts should be supplemented with the case when a possible case of accident occurs simultaneously in all six units.

- *In the course of the preparation of the Environmental Impact Study investigations were extended to all elements of the environment –required by legislation – and detailed migration studies were conducted and the expected additional doses for the population of neighbouring countries were determined for the cases of design basis accidents and design extension conditions. The outcome of the investigations are contained in Chapters 20, 21 and in the International Chapter of the EIS. Based on this document the accumulated radiological impacts across the border will remain within the dose restriction levels (taking into account all relevant isotopes, including iodine and caesium too) defined by the authority even in the case of releases caused by beyond design basis accidents, in other words the impact is neutral.*
- *In the event of accidents affecting more than one nuclear facility independent safety analyses are prepared. Such safety assessments play a role in the nuclear safety licensing procedure as part of the fundamental documents associated with official licensing of the nuclear facility.*
- *The evaluation of the environmental impacts of the currently operating 4 blocks does not belong to the scope of EIA report, because these have valid environmental and other licences (eg. operating license) as a result of previous licensing procedures.*
- *The methods and procedures recommended for the purposes of meeting the requirements and tasks specified in the legal and technical regulations concerning the management of nuclear accidents are contained in the guidelines attached to the National Action Plan for the Management of Nuclear Accidents. They are supplemented with the internal regulatory documents of the organisations and bodies contributing to the National System for the Management of Nuclear Accidents. The Action Plan for the Management of Nuclear Accidents of the facility shall be submitted to the National Atomic Energy Office for approval in the phase of the nuclear safety licensing procedure, this is not part of the Environmental Impact Assessment.*

Conclusions:

Due to the aforementioned reasons the Slovak Republic should be a party in evaluating the transboundary impacts of the activity concerned in the further stages as well, having regard to the fact that based on the information available so far the scope of transboundary impacts can not be evaluated thoroughly enough.

- *In the course of the preparation of the Environmental Impact Study investigations were extended to all elements of the environment –required by legislation – and detailed migration studies were conducted and the expected additional doses for the population of neighbouring countries were determined for the cases of design basis accidents and design extension conditions. The outcome of the investigations are contained in Chapters 20, 21 and in the*

International Chapter of the EIS. Based on this document the accumulated radiological impacts across the border will remain within the dose restriction levels (taking into account all relevant isotopes, including iodine and caesium too) defined by the authority even in the case of releases caused by beyond design basis accidents, in other words the impact is neutral.

7. Ministry of the Environment in the Slovak Republic, Section of Water Management

In your letter delivered on 25 May 2015 You have requested a position statement from the Water Management Section of the Ministry of Environment of the Slovak Republic with respect to the report prepared on the evaluation of the proposed activity entitled ‘The establishment of the new nuclear power plant units of Paks Nuclear Power Plant II site’, with a view to the provisions laid down in the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). The establishment of the new units is proposed in the inner territory of the Republic of Hungary in a distance of approximately 118 kilometres to the south from Budapest.

The proposed activity represents the erection of two new third generation pressurised water nuclear power plant units within the existing plant site of the Paks Nuclear Power Plant in the national territory of Hungary with a capacity of 1200 MW electrical output.

We would like to inform you that the Water Management Section **has no comment** in connection with the report prepared on the evaluation of the proposed activity.

8. Ministry of Foreign and European Affairs, Economic Cooperation Section, Slovak Republic

Based on your application we are pleased to inform you that the Economic Cooperation Section in Ministry of Foreign and European Affairs of the Slovak Republic **has no reservations** with respect to its scope of authority concerning the proposed activity.

9. Ministry of Agriculture and Rural Development, Section of Rural Development and Direct Payments

Based on your application sent to us in your letter dated on 18 May 2015 with the reference number of 1688/2015-3.4/hp, we are pleased to inform you that the Ministry of Agriculture and Rural Development of the Slovak Republic **has no comment** concerning the proposed activity entitled ‘The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site’.

10. Office of the Municipality District Nitra (Nyitra)

The Environmental Assessment and Administration Section of the Ministry of Environment of the Slovak Republic has sent to the Office of the Municipality District Nitra the report on the evaluation of the project entitled 'The establishment of new nuclear power plant units at the Paks II site in the territory of Hungary'.

The purpose of the project plan presented is to erect and commission two new nuclear power plant units within the national territory of Hungary at the existing site of Paks Nuclear Power Plant situated in a distance of 132 kilometres from the territory of the Slovak Republic.

We **have no comments** with respect to the aforementioned project plan and the associated evaluation report.

11. JESS Slovakia Nuclear Issues Society

Having evaluated and studied the documentation we would like to inform you that we have no comments.

12. Trnava District Office, Environmental Protection Department, Public Administration of Water Management and Priority District Issues of Environmental Elements

The purpose of evaluating environmental impacts before on site erection of the Paks II Nuclear Power Plant is to assess and evaluate certain environmental impacts generated by the technologies applied at the proposed nuclear power plant, with a view to the individual components of the environment and to the ecosystems pending on the state and exposure capacity of the areas affected by the project.

The Environmental Impact Study evaluating the impacts of Paks II applies the second approach: it assesses the processes of individual impacts, the consequences caused by impact factors in each phase of the project, their geographic coverage, in other words the affected zone, according to the individual components of the environment and according to ecosystems.

We **have no comment of fundamental importance** with respect to the information in the report drawn up about the evaluation of the proposed activity.

13. Ministry of the Environment in the Slovak Republic, Environmental Assessment and Administration Section, Department of Environmental Risks and Biosecurity

Based on your letter dated on 18 May 2015 in which you requested a position statement from us relating to the evaluation report of the project 'The establishment of new nuclear power plant units at the Paks Nuclear Power Plant site' we would like to inform you that having regard to the scope of authority of the Department **we have no comment** to the evaluation report.

14. Ministry of the Environment in the Slovak Republic, Section for Geology and Natural Resources, National Geological Administration Department

Due to its scope of authority the National Geological Administration Department has **no comment** on the documentation received dealing with the activity with transboundary impacts and its impacts on the environment in the Slovak Republic.

Based on the situation of the project area and the information disclosed it can not be assumed that the proposed activity would have any impact on the geological conditions in the territory of the Slovak Republic.

15. Ministry of the Environment in the Slovak Republic, Environmental Assessment and Administration Section, Department of Atmosphere Control

The proposed activity means the erection and operation of two nuclear power plant units with net electric output of 1000-1600 MW for the purposes of public electric power generation. The time required for the construction and completion of the nuclear facility is assumed to be 11 or 12 years, of which 5 or 6 years will be the preparatory phase and an additional 6 years of implementation. Useful lifetime for both units is 60 years. The new units would be located in county Tolna, within the public administration area of Paks city, approximately 5 kilometres from the city centre in an area owned by MVM Paks Nuclear Power Plant Ltd.

With a view to the nature and the location of the proposed activity the Atmospheric Control Department has **no comments** with respect to the report submitted.

16. Cultural Ministry of the Slovak Republic, Cultural Heritage Section

Following the review of the documents handed over, the Ministry is pleased to inform you that it has **no comments** on it.

At the same time please be informed that pursuant to the provisions laid down in paragraph (4) Article 30 of Act No 49/2002 Z.z. on the protection of monuments as amended several times, the mandatory position statement of the locally competent district monument protection office is required for all decisions to be made by any other public administration bodies or regional municipality agencies, which may affect the interests protected by the said legislation.

17. Ministry of Defence of the Slovak Republic, Asset Management Agency

Military administration has **no comment** for it has no special territorial claims in the area concerned.

With respect to Act No 24/2006 Z.z on the assessment of environmental impacts we **have no comments**, either.

18. Ministry of the Environment in the Slovak Republic, Environmental Assessment and Administration Section, Waste Management Department

Based on your request we are pleased to inform you that the Waste Management Department has **no comment** on the documentation received with the title 'The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site' with respect to its scope of authority.

19. Ministry of the Environment in the Slovak Republic, Nature Conservation and Landscaping Section

We do not assume any negative impacts on the environment in the neighbouring countries provided Paks II nuclear power plant is operated in normal operating condition and the safety principles are adhered to. In case of an accident adverse impacts are to be expected obviously to affect the wildlife of not only Slovakia but Europe as a whole, with limiting factors being mainly wind and water as transmission media.

Having regard to the above the Nature Conservation and Landscaping Section has **no objection** against the erection of the new nuclear power plant units in Paks from the perspective of nature conservation and landscaping in Slovakia.

20. Banská Bystrica (Besztercebánya) District Office, Environmental Protection Department

We do not assume any **negative impacts** on the environment in the neighbouring countries provided Paks II nuclear power plant is operated in normal operating condition and the safety principles are adhered to. In case of an accident adverse impacts are to be expected obviously to affect the wildlife of not only Slovakia but Europe as a whole with limiting factors being mainly wind and water as transmission media. Impacts on biotopes and species falling within the scope of interest of nature conservation are a lot less thoroughly investigated than those on humans.

Having regard to the above, the district office operating at the district seat has **no objection** against the erection of the new nuclear power plant units in Paks from the perspective of nature conservation and landscaping in Slovakia.

The issue of this position statement shall be without prejudice to the special legislation and to the provisions laid down in other laws and regulations.

Having regard to the above the Nature Conservation and Landscaping Section has **no objection** against the erection of the new nuclear power plant units in Paks from the perspective of nature conservation and landscaping in Slovakia.

21. Prešov (Eperjes) District Office, Environmental Protection Department, Unit for Public Administration of Water Management and Priority District Issues of Environmental Elements

The Prešov District Office, Environmental Protection Department, Unit for Public Administration of Water Management and Priority District Issues of Environmental Elements Prešov is not a competent authority in the course of the evaluation of the environmental impacts of the proposed activity in the fields of

- public administration in water management
- public administration in atmospheric protection
- public administration in waste management.

Following the review of the published documents it is assumed that presuming normal operating conditions the proposed activity shall **not have any substantial adverse impact** on the environment in Prešov District.

Having regard to the approximately 400 kilometres distance of the facility from Prešov District, please provide information on the further procedure.

22. Košice Municipality District Office

The issue is about the erection and operation of the new nuclear power plant units of Paks Nuclear Power Plant II. The plant is situated 118 kilometres to the south from Budapest. The total size of the area is 105.8 ha, of which plant areas account for 29.5 ha. The present four units of the nuclear power plant produce 2000 MWe electric power, accounting for 50.7% of all electric power generation in the Republic of Hungary. The new units equipped with VVER – 1200 type reactors manufactured in Russia will produce 2x1200 MW electricity on an annual basis. Rated coefficient of performance of the new reactors is assumed to be 92%, their useful lifetime is 60 years.

The closest inhabited area within Košice District (Gemerská Panica) is found in a distance of approximately 240 kilometres from the proposed activity, while the city of Košice is situated in a distance of 300 km. It is very difficult to assess what kind of adverse impacts the production equipment would generate in case of an accident. During the decision making process on the feasibility of the proposed activity it is of paramount importance that the suggested construction be investigated from the architectural and technical perspective, and that the most state-of-the-art technologies currently available in the nuclear industry could be deployed, with a maximum emphasis put on operational safety of Paks II nuclear power plant.

From the point of view of the impacts of the activity on the environment and regional development Košice Municipality District Office sets as a condition precedent for the approval of implementation of the proposed activity on the prospective site to have a transboundary assessment process for the intended project described under the title ‘The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site’ within the national territory of Hungary, on location of Paks.

- *In the course of the preparation of the Environmental Impact Study investigations were extended to all elements of the environment –required by legislation – and detailed migration studies were conducted and the expected additional doses for the population of neighbouring countries were determined for the cases of design basis accidents and design extension conditions. The outcome of the investigations are contained in Chapters 20, 21 and in the International Chapter of the EIS. Based on this document the accumulated radiological impacts across the border will remain within the dose restriction levels (taking into account all relevant isotopes, including iodine and caesium too) defined by the authority even in the case of releases caused by beyond design basis accidents, in other words the impact is neutral.*

23. Ministry of Economy, Slovak Republic

The Environmental Impact Assessment developed before the erection of Paks II Nuclear Power Plant to be established on the Paks plant site constitutes an integral part of the project documentation and contains the evaluation of the environmental impacts on the individual components of the environment and on the ecosystems by the technologies applied in the proposed nuclear power plant, pending on the state of the project area and the loading capacity. The document mentioned was evaluated for its contents and it was established that **no comments in connection thereof are to be raised.**

24. Košice (Kassa) District Office, Environmental Protection Department

The proposed activity means the erection and operation of two nuclear power plant units with net electric output of 1000-1600 MW for the purposes of public electric power generation. The location where the new nuclear power plant units are to be erected is situated on the reserve area of the nuclear power plant operated at Paks, in other words the anticipated two new units would be established to the north from the currently operational four units in their next proximity. New units are to be selected from the so called third or 3+ generation. Preliminary research conducted as part of the preparations for the new nuclear power plant units suggested the use of pressurised water type units operated with cooling water extracted from the River Danube and equipped with a double level cooling system.

The Paks Nuclear Power Plant site is found in county Tolna, approximately 118 kilometres to the south from Budapest. The site lies about 5 kilometres to the south from the city centre of Paks, 1 km to the west from the Danube and 1.5 km to the east from the main public road. The southern national border can be found between 63 to 75 kilometres to the south from the site, 94 km upstream on the river Danube (the existing power plant is located at river kilometre 1527, the national border is situated at river kilometre 1433). The new plant site is located in the neighbourhood of the operating Paks Nuclear Power Plant within the plant property boundaries. The broader surrounding of the site (a 30 km radius area) is divided into two halves by the river Danube. Transdanubia is on the western side and the area between the Danube and the River Tisza on the east.

The proposed fuel for the new nuclear power plant units designed for the Paks site is enriched uranium dioxide. Transportation of the fuel to the site will take place mainly on railroad in containers complying with the relevant laws and regulations.

The construction period of the facility is 11 or 12 years, the preparatory phase is planned to last for a period of 5 or 6 years, with an additional 6 years dedicated for implementation. The first unit of the nuclear power plant would start operation before 2025, the second one before 2030. Designed useful lifetime of the units is 60 years.

On behalf of nature conservation and landscape protection administration

We do not assume any negative impacts with respect to the erection of the nuclear power plant units to be established in Paks, Hungary from the perspective of nature conservation and landscape protection, provided the safety measures are adhered to during the construction and operation of the new Paks II units in Paks nuclear power plant. We have **no comments** with respect to the non-technical summary of the report evaluating the proposed activity.

On behalf of water management administration

According to the study received, from the perspective of the protection of water resources and water courses in the Slovak Republic the highest risk factor is attached to the proposed activity following the accidents, if any, the so called beyond design basis accidents, DEC1 or severe accidents, DEC2 in the form of airborne migration of solid radioactive contamination. Probability of occurrence of the events referred to above was described with a $f=10^{-6}$ reactor/year value (Chapter 2.3.3, Page 15).

During the construction and standard operation of the facility the designer does not assume any adverse environmental impacts in the territory of the Slovak Republic.

Wind is the atmospheric factor which may have the most significant influence on the migration of radioactive substances, which would then settle in surface waters and watercourses, eventually in the soil, potentially causing contamination of underground water bodies as well. Based on the study received and the findings of long term meteorological measurements the dominant wind direction in the area concerned was north-western throughout the year (Chapter 2.3.2, Page 13).

Waters crossing the Košice District are flowing within the Danube River basin. The River Danube flows into the Black Sea with a water flow from north-western to south-eastern direction. Radioactive doses of transboundary liquid discharges and the increase of water temperature as a result of the heat exchange during the cooling of the units do not represent any adverse impact to be considered with respect to the aquatic flora and fauna (Chapter 1, Page 5, paragraphs 4 and 5).

Having regard to the fact that no adverse impacts are anticipated for the waters and water-related facilities of the Slovak Republic as a result of the proposed activity, and with a view to the meteorological conditions prevailing at the location where the activity entitled 'The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site' is to be implemented, and to the strategic economic significance of the facility, we have **no objections** against its construction on behalf of the water management administration.

On behalf of waste management

Since the waste management body of the district is not competent in issues related to the management of radioactive waste, and considering that Act No 223/2001 Z.z. on wastes and on amending certain Acts does not apply to the management of radioactive waste as stated in item e) paragraph (2) Article 1 thereof, the district waste management body shall make no statement in relation to the issue.

Public administration related to the protection of the atmosphere

According to the assumptions the construction of the new nuclear power plant units will last for 5 or 6 years. The source of air pollution will be mainly related to the construction procedures, traffic on the construction site and the associated higher level of dust exposure during the construction phase.

Process related emissions originate in the case of the new nuclear power plant units from the operation of emergency energy supply sources and pumps. One nuclear unit is to be operated by 2-4 diesel electric generator units, with an output of 4-7.5 MW. According to the assumptions made the running hours of these pieces of equipment will fall short of 50 running hours a day for any type of reactor. Provided the period of operation exceeds 50 running hours such equipment are to be put into operation which are able to maintain the limit values. In the case of diesel electric generators the most important factor should be the emission of sulphur-dioxide and nitrogen oxide. During maintenance and overhaul periods, for instance, the contamination of the air with formaldehyde shall be reckoned with, while during the smothering of insulation materials CO may be formed and ammonia generated in case the steam generators are re-started.

Environmental impacts of the new facilities must be monitored during the operation phase – in terms of both radiological and classic impacts – by the installation and operation of an environmental monitoring system.

Conclusion:

In the event of implementation of the proposed activity in question, entitled ‘The establishment of new nuclear power plant units at the Paks Nuclear Power Plant II site’ in the Republic of Hungary, 5 kilometres from the city of Paks, provided the safety measures are adhered to during the construction and operation of the new nuclear power plant units, no adverse impact on the individual elements of the environment and their quality within the territory of the Slovak Republic is assumed. Based on this the district office **approves the implementation of the proposed activity**, under the condition that the interventions affecting the natural environment will be minimal and the measures intended to mitigate the adverse impacts of the proposed activity on the individual elements of the environment will be complied with.

The position statement of the body concerned (district office) herein will not replace the position statement and decision to be issued by the competent body, i.e. the Environmental Assessment and Administration Section, Environmental Assessment Department of the Ministry.

25. Public Health Agency of the Slovak Republic

The erection of pressurised water reactors with containment is proposed for the Paks site. In the documentation published, five versions of Suppliers and reactor types are included. The proposed site is situated in a distance of approximately 130 km from the borderline of the Slovak Republic. The documentation assessed the impacts of the erection and operation of the proposed reactors on the environmental elements, and a short chapter includes the evaluation of transboundary impacts of the new nuclear power plant units. Waters contaminated with radioactivity will be discharged into the Danube.

Position statement issued by the Public Health Agency of the Slovak Republic:

Having regard to the data disclosed in the documentation received and the publicly available data concerning the proposed reactor units it can be expected that the transboundary exposition impact of the new nuclear power plant units to be erected at the Paks site in the Republic of Hungary affecting the population of the Slovak Republic will be negligible in case of normal operating conditions, however the potential consequences of accidents in these reactors may have serious adverse impacts on the environment and population of the Slovak Republic.

Justification:

The documentation compares a few nuclear power plant versions with various capacities. Each of the reactor types considered are to be provided with a protective reactor envelope and shall belong to the most recent and safest type of reactors, during the development of which high level of operational safety requirements were enforced. Based on the project parameters, releases caused by low level activities can be expected during normal operation and even in case of project accidents and serious emergency cases. Environmental elements situated within the territory of the Slovak Republic are exposed to only those radioactive substances which are discharged or which get into the atmosphere. The conclusion stating that their impact will not be significant was derived from the parameters of the reactors to be considered and experiences gained from similar reactors operated in other countries. The documentation contains relatively little information which would allow the judgement of the methodology used to evaluate transboundary impacts and the input data used, for instance data concerning the probable activity level and composition of the substances released in case of an accident, the wind pattern etc. The design does not contain any direct calculation methods of the transboundary consequences, which would demonstrate the level of exposure to the population in the Slovak Republic. However, based on the data included in the design scheme it can be assumed that the level

of radiation and the health impairment of the population in the Slovak Republic is considerably lower than the value deemed to be insignificant under the international recommendations.

- *In the course of the preparation of the Environmental Impact Study investigations were extended to all elements of the environment –required by legislation – and detailed migration studies were conducted and the expected additional doses for the population of neighbouring countries were determined for the cases of design basis accidents and design extension conditions. The outcome of the investigations are contained in Chapters 20, 21 and in the International Chapter of the EIS. Based on this document the accumulated radiological impacts across the border will remain within the dose restriction levels (taking into account all relevant isotopes, including iodine and caesium too) defined by the authority even in the case of releases caused by beyond design basis accidents, in other words the impact is neutral.*