

# Comments

## on the Environmental Impact Assessment process for the new nuclear power plant units at the Paks site (Hungary)

Kyiv, September 2015

### **Basis for the comments preparation**

On April 8, 2015 Ministry of ecology and natural resources of Ukraine has published on their website “materials on the Environmental Impact Assessment for the new nuclear power plant units at the Paks site (Hungary)”. These were made available to Ukrainian public as required by the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). Ukraine is considered to be an affected party and according to the Conventions’ requirements its public should be given an opportunity for a full review of information and expression of its concerns and view points, and for ensuring that its input is taken into due account in the decision-making process.

Environmental Impact assessment study (EIAS) for Pars II project, a key document for this consultation process, should meet the requirements of the Espoo Convention, as well as requirements of the EU Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by EU Directive 2014/52/EU (EU EIA Directive). The procedure has to be in line with the requirements of the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention).

These comments have been prepared by National Ecological Center of Ukraine (NECU) based on English version of the following documents:

- Simplified public summary,
- International Chapter of Environmental Impact Study,
- Environmental Impact Assessment Study, Volume 1;

### **Chapter 1. General comment on procedure**

We acknowledge that these public consultations with affected parties under Espoo Convention are arranged when the decision on the electricity generating technology (nuclear power), site (Paks), reactor type (VVER-1200) and supplier (Russia) has been already made by Hungarian government and concluded by Hungarian parliament in Act II 2014. Therefore we believe that proposed process does not provide for our comments and concerns regarding these crucial parameters to be taken into due account. Chapter 1 of EIAS suggests that before parliament ratification of the agreement with Russia there were preliminary assessments done in 2012-2013, and this is when we believe consultation under Espoo should have been arranged to fully provide for meeting the letter and the spirit of the Espoo Convention.

In addition, it is clear from EIAS (EIAS Volume I, para.1.1.1, page 27) that the decision of 1008 and the principle consent of 2009 by the parliament to construct additional units at Paks NPP were final as to no-action

alternative and siting alternative respectively. As the EIAS states, the decision of 2009 was required by the Act on Nuclear Energy.

It is unclear from EIAS documentation when and by what public authority the decision was taken on the choice of reactor type in favour of VVVER-1200.

Given these facts, we request a clear explanation of the relevant decision-making procedure required under national legislation in Hungary to start construction of nuclear units at Paks NPP. In particular, we request (a) clear indication what is considered to be the final decision, in the meaning of the Article 6 of the Convention, for the project subject to these consultations and (b) clear indication how our comments will be taken into account in such final decision.

### **Simplified public summary**

Proposed simplified public summary is hardly serving the main purpose of a non-technical summary which is to provide wider public with more accessible information. It is highly technical document, with hardly any simplifications compared to EIAS, failing to provide justifications for the option chosen. The non-technical summary should contain the main proposals for the project and a clearly formulated justification for choices made, including the use of visualisations to more clearly explain all this (Espoo Convention, Appendix II, paragraph (i)).

**This document has to be rewritten to fit the requirements and its main purpose and then resubmitted for public scrutiny.**

## **Chapter 2. Comments to Environmental Impact Assessment Study (EIAS)**

**1. Purpose of the project.** In different parts of documentation different purpose of the project is stated.

The Data on the Planned Activity states that the purpose of the projects is “**generation of electric power for public purposes**” which implies that the goal to “build two modern, III+ generation, pressurized water nuclear power plant units, each having 1200 MWe capacity and an expected life of no less than 60 years” formulated in BASIC INFORMATION ON THE PLANNED PROJECT (Paks2\_NPP\_EIA\_Report-1-8\_EN.pdf, page 27) **is not actually a goal but a mean of reaching the goal**. This confusion over the true purpose of the project impacted the scope of the study, and many EIAS shortcomings and concerns identified below in these comments could have been probably addressed if project’s promoters would clearly formulate project’s goal and stick to it. We see that project seeks “to produce 19 TWh of electricity per year (on the basis of 2400 MWe capacity and 90% availability factor” which can be achieved by other means (and combination of means) not only with constructing 1200 MWe nuclear power plant, which is a proposed activity in this project.

**2. No alternatives.** The ESIA does not provide information and analysis of any reasonable alternatives to the proposed activity, as well as no justification for the option chosen – two nuclear units of VVER type at multi-unit nuclear power plant site at Paks. Meanwhile, the EIA Directive art 5 (1(d)) prescribes for the EIAS “a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the

effects of the project on the environment". The Espoo Convention prescribes for the EIAS in Appendix II (b): "A description, where appropriate, of reasonable alternatives (for example, locational or technological) to the proposed activity and also the no-action alternative;" and adds that these alternatives have to be assessed on its environmental impacts (Appendix II (c, d)). These alternatives furthermore have to be subject to the transboundary consultations (Espoo art. 5 (a)). At least these should have included a comparative analysis of environmental and socio-economic impacts of different electricity generating technologies (including renewable energy technologies), reactor types, suppliers and location. Lack of such assessment is of big concern to Ukrainian public minding that:

- chosen technology implies additional risks to public health and economy of our country in case of serious nuclear accidents;
- chosen supplier (Russia) implies additional serious risks arising from transportation of nuclear fuel from Russia for at least 20 years through Ukraine's territory and spent nuclear fuel back to Russia for temporary storage and/or reprocessing;
- chosen site is at Danube river bank upstream from Ukraine's territory;

**The EIAS should be re-worked to include comprehensive analysis of environmental and socio-economic impacts of different electricity generating technologies (including renewable energy technologies), reactor types, suppliers and location, and resubmitted for public consultations**

**3. Lack of important information.** The EIAS report for the Paks II project does not give all information necessary for project's justification such as:

- relevant economic information;
- assessment of reliability the chosen supplier – Rosatom;
- information about the environmental impacts of the entire fuel chain (including uranium mining and fuel production);
- crucial information about nuclear risk and safety;
- information about the environmental impacts of a severe accident with substantial emissions of radioactive substances into the environment;
- information about the lack of information and knowledge, lack of experience and stand of technology in radioactive waste management, especially concerning high-level wastes.

All of the above have relevance to decision-making procedure on Paks II and should be made available for public scrutiny according to Aarhus Convention art. 6(6): "Each Party shall require the competent public authorities to give the public concerned access for examination, upon request where so required under national law, free of charge and as soon as it becomes available, **to all information relevant to the decision-making** referred to in this article that is available at the time of the public participation procedure, without prejudice to the right of Parties to refuse to disclose certain information in accordance with article 4, paragraphs 3 and 4."

**Economic information:** widely-known potentially severe negative impacts of nuclear power demand that admissibility of any new nuclear facility is justified against other less risky options, and such justification is not

possible without economic analysis. For nuclear power the latter has to include also the cost of damage in case of severe nuclear accident takes place, full cost of spent nuclear fuel and radioactive waste management and final disposal, and plant decommissioning; **The fact that some of these costs are not possible to estimate (because for ex. no one still knows the cost of final disposal of high-level radioactive waste or the possible economic damage in case of severe accident) should not result in neglecting these very significant cost in current decision-making process.**

**Reliability of chosen supplier:** Rosatom has a record of over-due and over budget projects both within the country (Leningradskaja and Novovoronezhskaja NPPs) and abroad (for ex. Belene project in Bulgaria). The latter has been cancelled due to severe understatement of costs, corruption allegations and refusal to face important environmental challenges, including seismic risk. Going over the budget raises the risk of cutting edges on safety and environmental protection measures thus sufficient justification of the proposed choice of a supplier is crucially important to have in EIAS;

**Information on full fuel chain:** impacts on environment from uranium mining, enrichment and cassettes production should be described in this EIAS. Fuel production is inevitably linked to the construction and operation of Paks II, and that have considerable environmental impacts, thus it is relevant for the decision-making and necessary under Aarhus article 6(6).

**Information on radioactive waste final disposal:** The same is applicable to the issue of management and final disposal of radioactive waste and spent nuclear fuel – these will have environmental consequences also for future generations, thus it is relevant for the decision-making and necessary under Aarhus article 6(6). To date there is still no successful experience anywhere in the world with deep geological disposal – the only option the authors of EIAS rely upon. Other options mentioned include technologies that are still a science-fiction, not operational technologies. There is still no final disposal solution for radioactive waste problem anywhere in the world, and EIAS has to acknowledge this fact and at minimum provide analysis of all options that are currently being looked at by researches, incl. deep borehole disposal and fully engineered surface or near-surface options.

**Nuclear risks, safety and security:** The EIAS uses Probabilistic Safety Analysis (PSA) to determine nuclear risk of an accident with severe core damage.

*“As a result of the above, nuclear power plants can be built today with a probability of grave accidents affecting the environment being less than 10<sup>-6</sup> per reactor year.”* (Paks2\_NPP\_EIA\_Report-1-8\_EN.pdf, page 67).

We believe this sentence is false and misleading. For the past 60 years six accidents with significant release of radioactivity into the environment took place at 5 nuclear reactors (Three Miles Island, Chernobyl 4, Fukushima 1, 2, 3) far higher than the previously set PSA limit of 10<sup>-5</sup>, and the consequences have been devastating. This suggests that the factors that are not taken into account in probabilistic risk assessment (such as human failure, extreme weather events, malevolent behavior, etc.) do impact the true probability of severe accident taking place. Therefore only probabilistic risk assessment is insufficient to come anywhere close to

understanding of true probability of severe accident at any of the nuclear units, including at Paks II. The **lack of assessment of beyond design conditions is not acceptable** as a number of events such as at Three Mile Island, Mayak, Chernobyl, Fukushima show that severe accidents (incl. beyond design) do happen in reality.

The EIAS clearly lacks information on the following issues:

- multi-unit incidents and accidents;
- problems caused by incidents or accidents in other units on the site;
- security – the risk and potential impacts of sabotage, terrorist attack and acts of war;
- emergency preparedness and response;
- problems with radioactive water after a severe accident.

**The EIAS should be re-worked to include all information relevant for a decision-making process necessary under Aarhus article 6(6).**

**4. Misleading conclusions.** The summary of the non-technical report, hidden at the very end of the document, in its very last paragraph concludes the findings of this EIAS:

*“In accordance with the detailed analyses of the environmental impact assessment study, the implementation of Paks II. affects the settlements of Dunaszentbenedek and Paks települések, while the operation of Paks II. will affect Dunaszentbenedek, Paks and Uszód settlements.”*

It is not surprising that this statement has been buried so deeply. If an EIA of a nuclear power reactors fails to identify any potential risk from nuclear reactors for people outside of 30 km zone now, after thousands of people in dozens of countries has been affected by Chernobyl and Fukushima accidents, than such EIA is completely insufficient and inadequate and should be dismissed.

### **Chapter 3. Comments to International Chapter of Environmental impact study**

(Paks2\_NPP\_EIA\_Report\_Transboundary\_chapter\_EN.pdf and additionally  
Paks2\_NPP\_EIA\_Report\_19\_RadioWaste\_EN.pdf)

Authors of the transboundary chapter of the EIAS claims that “cross border impact are not anticipated even in the case of operating trouble” (page 6.) We believe that EIAS do not provide sufficient justification for such a claim to be made.

**Impact of emission:** authors say they were looking into impact area of airborne emissions “in case of operating troubles due to design fault” but not beyond design base. Beyond design base conditions should have been assessed as well. The claim that probability of beyond design base event is so low it does not deserve assessment is not convincing – the reality unfortunately did not prove initial nuclear lobbies

prognosis of severe nuclear accidents probability below 10<sup>-6</sup> per reactor year. Up to the year 2011 all reactors in the world operated totally around 10 000 reactor/years. During this time at least 11 severe accidents (with core meltdown or/and ruining of the reactor) has happened (Enrico Fermi, Lucens, Saint-Lorent, Beloyarskaya, Bohunice, Leningradskaya, Three Mile Island, Chornobyl 4, Fukushima 1,2,3) and 5 more severe accidents has happened at other nuclear energy facilities. Sixteen severe accidents for 10 000 reactor/year mean 1 severe accident each 625 reactor/year which mean the risk of 10<sup>-3</sup>, 1000 times higher than expected acceptable probability; This in our view oblige any company/country wanting to construct new nuclear power units to seriously address beyond design conditions.

**Impact on Danube river:** *“In the event of environmental impact concerning the quality of the air, terrestrial and aquatic wildlife, the urban environment and the landscape as such... the possibility of cross border impacts is not taken into account” (Page 6);*

Discharge of radioactive water into Danube in case of accident was not even mentioned among the Potential impact factors in the course of the Paks II investment project (Table 51, p.180 of main EIA study). Impacts after a severe accident with substantial emissions of radioactive substances can lead to substantial contamination of the air, terrestrial and aquatic wildlife, as for instance the contamination of reindeer in Lapland, deer and sheep in the UK and wild boar in the Schwarzwald and Bavaria have clearly shown after the Chernobyl catastrophe. It is likely that after a severe accident in Paks, migrating fish in the Danube will be heavily contaminated with severe consequences for fishery activities downstream (Croatia, Serbia, Bulgaria, Romania and Ukraine). It is therefore not justified that these are not taken into account;

**Radioactive waste and spent nuclear fuel management:** *“Impacts on waste management remains local in all of the cases and hence, no cross border impacts can be talked about” (Page 6, transboundary chapter);*

Because spent nuclear fuel management and disposal is not elaborated anywhere else separately in this chapter we assume that this statement is meant to cover also the issue of spent nuclear fuel assemblies.

The above mentioned statement is clearly in contradiction with what is elaborated in non-technical summary (Page 232), with the reference to already made agreement (contract) with Russia where it says that one of the options under consideration is to transport spent fuel to Russia for temporary storage and reprocessing:

*“Following storage in the decay pool, spent fuel is transferred for temporary storage. There are currently two options available:*

*□ the spent fuel assemblies are transported to the Russian Federation for temporary technological storage or for technological storage and reprocessing. The spent fuel, or in case of reprocessing the nuclear waste, is then stored in the territory of the Russian Federation for the duration of the time period defined in Article 7, Paragraph 1 of the agreement (contract) regarding nuclear fuel supply (20 years). then it will be returned to Hungary,*

*□ the domestic temporary storage of spent fuel.*

Transport of spent nuclear fuel to Russia may have impacts on the territory of Ukraine, as well as on the other countries of transit including Hungary itself. For the latter reason a detail analysis of risks should be part of the main EIA study and not only of the international chapter. Moreover, transport for the reason of interim storage creates an unjustifiable extra risk as safe temporary storage in Russia is as (im)possible as in Hungary.

In order to judge impact on Ukraine of potential spent nuclear fuel transports, Hungary should make a choice now if it intends to have the spent nuclear fuel reprocessed in Russia or not. Given the unacceptable transport of spent nuclear fuel through Ukrainian territory in 2014 we do not have confidence that the Hungarian, Ukrainian and Russian authorities can be entrusted with these decisions and therefore we demand the option of reprocessing in Russia and all transport of spent nuclear fuel through Ukraine to be withdrawn.

While making such a choice there should be a comparative analysis available on potential environmental impacts of both options, as well as of political risks and economic effects. In case it is planned to be prepared on later stage how will the Hungarian government ensure that potentially affected countries will have an opportunity to review, comment and have their comments to be taken into account?

Such analysis is of high interest and importance for the public of potentially affected countries through which such transport is to happen. We may assume (although such information is missing from an EIAS) that one of likely options of the transport route is through the territory or an airspace of Ukraine. Given the long operation time of the proposed project (more than 60 years) it is not possible to guarantee political stability in Hungary and in neighbouring states for this period of time. That is not a hypothetical thing. Already in 2014 transport of spent fuel from Hungary has been taking place through war-torn Eastern Ukraine which is most certainly not in line with strict instructions and process descriptions as pre-planned by the project. It has proven that too little sense of responsibility exists concerning these risks within the Hungarian nuclear establishment – this includes MVM and the nuclear regulator OAH. **An analysis of potential severe accidents with the SNF during transportation and storage, including those caused by human failure and/or malevolent intent, should be prepared and made available for public and decision-makers.**

The chapter also misses an analysis of potential severe accidents in the SNF storage (temporary and final disposal) – a very important issue as the Fukushima catastrophe has illustrated.

#### **Joint impact of two power plants: 3.5.6, Page 37;**

Does your reply mean that at present stage when consultation with potentially affected parties are taking place, project promoter has no evidence that construction of new NPP will not threaten safe operations of existing Paks NPP. If these evidences are available, why they are not part of this EIAS study?

**EIA's chapter on transboundary impacts should be re-worked to provide sufficient analysis of potential transboundary impacts of Paks II operation and decommissioning; Current version of an EIAS submitted for public consultations does not provide sufficient analysis of potential transboundary impact, including on territory and people of Ukraine, and the conclusion regarding no cross border impacts is totally unjustified.**

#### **Concluding remarks**

We would like to reserve our right to come up with additional comments and questions during public hearings in Kiev scheduled for October 7<sup>th</sup> and after it within formal consultation period or later when other additional documentation has been made available to the public.