

MINISTRY OF POWER ENGINEERING OF THE REPUBLIC OF BELARUS
DESIGN SCIENTIFIC-RESEARCH REPUBLICAN UNITARY ENTERPRISE
«BELNIPIENERGOPROM»

**SUBSTANTIATION OF INVESTMENTS IN CONSTRUCTION
OF THE NUCLEAR POWER PLANT IN THE REPUBLIC OF BELARUS**

ENVIRONMENTAL IMPACT ASSESSMENT


**STATEMENT ON POSSIBLE ENVIRONMENTAL IMPACT
OF BELARUSIAN NPP
(PREVIEW REPORT ON EIA OF BELARUSIAN NPP)**

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2009



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15 October 2009

No. (1-15)-D8-8864

**REGARDING THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE
CONSTRUCTION OF NUCLEAR POWER PLANT IN THE REPUBLIC OF BELARUS**

Dear First Deputy Minister A. N. Apatskiy,

We are thankful for your letter regarding the environmental impact assessment (EIA) for the construction of nuclear power plant (NPP) and the EIA report for this project. We have circulated this report to the interested Lithuanian authorities and scientific institutions for comments. The following comments and recommendations were provided:

- 1) The EIA procedure according to Belarusian legislation is unclear. To understand the difference among different steps of this procedure, the general overview of the EIA procedure, communication and participation of the affected countries should be presented and different stages of this procedure should be explained.
- 2) The construction, operation and decommissioning of the NPP should be performed in accordance with the highest standards of safety. Implementation of requirements of these standards should be assured during all the life cycle of the facility. Legal basis for licensing steps during implementation of the NPP project is not presented in the EIA report. The information about licensing procedure, as a part of the final stages of this process, and national requirements on it should be included in the EIA report, and the role of EIA should be explained.
- 3) It is not clear, how the Republic of Belarus will develop the national infrastructure before, during and after construction of the NPP to ensure proper implementation of the following nuclear safety principles (presented within International Atomic Energy Agency (IAEA) publication SF-1). During the EIA stage implementation of the following three principles deserve special attention:

1. The prime responsibility for safety must be taken by a person or organization responsible for facilities and activities that could cause radiation risks. Namely, how the organization responsible for nuclear safety will be established and reliably assessed whether it is capable to organize design, construction and conduct other activities important to nuclear safety?

2. An effective legal and governmental framework for safety, including an independent regulatory body, must be established and sustained. Namely, whether the Republic of Belarus will develop the infrastructure necessary to provide the competent staff, technical support and perform independent nuclear safety assessments according to IAEA recommendations?

3. Effective leadership and management for safety must be established and sustained in organizations concerned with, and facilities and activities that could cause radiation risks.

- Namely, what standards for environmental protection and management systems will be applied by organizations performing activities important to safety of the new NPP?
4. For the site evaluation three locations (Krasnaya Polyana site, Kukshinovo site, Ostrovec site) were selected. The characteristics of these sites are presented, but justification why Ostrovec site was chosen as top priority one is insufficient and more detailed information about characteristics and factors significant for this selection should be presented (for example, explanation and more information about opportunity of activation of suffusion and karts processes at the Krasnaya Polyana and Kukshinovo should be provided).
 5. The comparison of alternative sites by the degree of adverse effects on the environment should be a major factor in the final selection of the site, therefore, in the EIA report should be paid sufficient attention to this comparison. However, in chapter 4 of the report a quite detailed analysis of possible impacts of NPP on the environment in the 30-km zone is presented only for Ostrovec site, the report does not hold such information on other potential sites and does not compare the impacts of sites on the components of environment.
 6. Furthermore, the Ostrovec site is the site closest to the border of the Lithuania and only 40 km from Vilnius, the city with population more than 500 000. In accordance with IAEA Safety Requirements NS-R-3, "Site Evaluation for Nuclear Installations" (2003), the combined effects of the site and the installation shall be such, that the radiological risk to the population associated with accident conditions, including those that could lead to emergency measures being taken, will be acceptably low. The risk should be low for both states, but it was not analysed for Lithuania. The collective dose as a function of distance and direction should be calculated and used as a tool to evaluate this risk.
 7. The EIA report lacks data on the air corridors close to the alternative NPP sites, the intensity of flights on these corridors and the distance to the nearest civilian and military airfields. It is essential to compare the alternative sites by these criteria.
 8. In chapter 2.3.4 the positive characteristics of PWR reactors are listed, but not all of them are justified. The information to show that doses from PWR reactors are minimal should be added. Some comments about all characteristics should be provided.
 9. In chapter 2.5 it is stated that Russian project for the Belarusian NPP was chosen after comprehensive analysis of industrial reactors units. Which features and criteria were used and were important for this selection? The results of this analysis that was made for selection should be presented in the EIA report.
 10. The figure 6 shows, that reactor containment can withstand the plane crash, but any quantitative (weight, speed of falling) or qualitative (type of the plane) characteristics of such influence are not presented. The EIA report must be supplemented with indicated characteristics.
 11. In table 12 it is written that the "effective time of utilization of installed capacity during a year" is not less than 8400 hours. But on page 61 of EIA report (English version) it is written that calculation of total quantify of formed slag during operation of two units is based on estimated hours of operation (6500 h/ year). Please explain this difference or correct one of the given values.
 12. Information about fuel handling and storage is not sufficient. The submitted documentation only reveals that spent nuclear fuel will be transported in special shipping packaging sets. The information about safety of nuclear fuel transportation (technical and administrative measures should be mentioned) and impact of this transportation on the environment should be extended.
 13. It is not clear if the national nuclear waste management concept or strategy exists. Information about radioactive waste management within the plant is very general, it is not clear if solid waste will be sorted depending on its type and stored in one or several different facilities. Plans for new disposal facilities also are unclear and not presented. The overview with the focus on solid radioactive waste management within the plant and facilities for disposal should be provided. The report does not contain explanation about environmental impact of management of radioactive waste and spent nuclear fuel within the plant. If impact of radioactive releases from radioactive management and storage facilities is discussed together with the impact from the power plant this should be mentioned in the text.
 14. In the report, a forecast of the volume and activity of liquid radioactive waste is not given. The report should be supplemented with a quantitative estimation of liquid radioactive waste.

15. The table 15 shows the "Agreed value of gross discharge" and "Actual data" of total gross discharges into atmosphere. Please explain the term "Agreed value of gross discharge". Who has set this value? In which document and for what conditions this value is given? Please clarify for what specific plant with PWR-1000 are "Actual data"? How will they be correlated with data for the planned NPP, which has more power, and perhaps having a fundamentally different scheme, other equipment and technology?
16. EIA report should include detailed information about sewage waters, which will be generated during the construction and operation of the NPP. Information about the contamination, treatment and discharge of sewage waters should be given. Additionally the requirements of Belarus legislation regarding the contaminations of discharged sewage waters should be mentioned. The impact assessment of discharged sewage waters on sewage receivers based on calculations should be provided.
17. In section 3.1.5 activity of radionuclide discharges into atmosphere from different Russian NPPs are presented as an example, but there is no information about planned discharges from Belarusian NPP in the report. If assumption is done that discharges from Belarusian NPP will be similar as in Russian NPPs, still there is no information on permitted levels in Russia, only percentage of discharged levels from allowed (table 23) and reference to normative documents. Unfortunately we have not access to documents mentioned in the report and simultaneously possibility to find approved limits. Moreover, the limits on discharges that are in force in Belarus are also not given. The information how the allowed level in Belarus will be defined should be also presented.
18. Table 23 shows that the same percentage of radioactive substances from allowed level for different types of NPPs meets different absolute values of emissions. For example, 16 % of radioactive substances for Novovoronezh plant emissions correspond to 110 TBq, and for the Leningrad NPP – 16 % correspond to 597 TBq (more than 5 times greater). Similar discrepancy can be traced to emissions of I-131, Co-60, Cs-134, Cs-137. Please explain whether different annual allowed discharges are established for different types of reactors in Russian Federation? Do the norms of radioactive substances set out in Russian Federation correspond to international standards?
19. Table 24 lacks information on radionuclide composition of liquid discharges.
20. One of the objectives of the EIA is to assess the general impact on population. Unfortunately, important data is missing in the EIA report: the population dose during the normal operation is not calculated. Detailed information about releases from different reactors at NPPs of Russia into water and air is provided, but the dose to population caused by the releases from Belarusian NPP is estimated neither for Belarusian population, nor for affected countries. Assessment of the radiological impact on the population during the normal operation of the new NPP, assuming the radionuclide releases, should be provided and information about dose limits and constraints should be presented and explained.
21. Modelling of radioactive contamination spread during normal operation was not done and transboundary radiological impact of the Belarusian nuclear power plant has not been analyzed. Information about annual dose as a function of distance and direction up to 50 km could be presented. A useful way for demonstration of relative impacts on the Belarusia and affected countries would be to calculate the collective dose from normal operations in each state. This can then be weighed against the relative benefits from the Belarusian NPP to each state.
22. The maximum design-basis accidents (MDA) scenario during the summer season was analyzed. The term of MDA is not defined in the Report. It is not clear what type of accident is analyzed and what classes MDA according to the INES scale can be attributed to it. It is also unclear why the MDA scenario was not analyzed during the winter season. More background information should be provided on the design basis source term and the conservatism inherent in this source term.
23. In chapter 5.1 more background information should be provided on the beyond design-basis accident source term and the conservatism inherent in this source term as well as on the validation of computer code that was used for simulation of radionuclides dispersion and deposition. The list and results of analyzed accidents scenarios should also be presented.

24. When considering environmental impact assessment of a nuclear power plant in a transboundary context, a threat of a severe accident and related radiological contamination should be provided. Based on the directions of air mass movements in the EIA report it is stated that the part of Lithuania under conditions of beyond design-basis accident will be contaminated. More detailed information (the picture to show the results) about location of contaminated territories and levels of this contamination should be provided.
25. The results of calculation of pollution in Republic of Lithuania under condition of beyond design-basis accident with South-West emission trace should be presented as well. Nevertheless, it should be proven that conservative initial conditions are taken into account (wind speed, direction and etc.). The pollution and doses in Vilnius area shall be presented taking into account the conservative initial conditions as well.
26. The given information indicates that the hazards for Lithuania will exist due to the contaminated soil, which activity will be 1000 times higher than natural background. The comparison of maximum emergency emission of radionuclides from Novovoronezh NPP-2 and new NPP in Belarus is not the reason to state that the contamination of the territory of Lithuania by long lived radionuclides after maximum emergency emission at the Belarusian NPP will be absent. The conclusion is not well grounded. A deeper analysis to state such conclusion must be made.
27. It is not clear how the doses for population due to the maximum design based accident and beyond design-basis accident were calculated. What models for estimation of impact on the population were used? More background information should be provided on the radiological dose assessments and the conservatism inherent to these assessments.
28. The maximum doses due to beyond design-basis accident are calculated but nowhere in the EIA report is indicated that the hazards are acceptable. When the graphic information about doses of population distribution is presented, analysis of these results should be performed and conclusions should be made. Also it is not clear on what directions of air mass movements the calculations are based. The evaluation of the impact to Lithuania should be conservative and "the worst scenario" should be analyzed.
29. In chapter 5.2.4 the impact of the discharges of tritium (H-3) and other radionuclides on Neris (Vilija) river in the territory of Lithuania should be assessed.
30. The evaluation and conclusion about transboundary impact on public health of the Republic of Lithuania is not given and there is some doubt if this impact will be insignificant.
31. According to the IAEA-TECDOC-953 "Method for Developing Arrangements for Response to a Nuclear or Radiological emergency" the suggested radius for urgent protective action planning zone is 25 km when EIA report refers to 20 km. The justification of selection of this value should be described.
32. In chapter 5.4.1 of the report it is indicated that the long-term protective measures based on environmental and food products monitoring should be carried out in the 300 km zone around the NPP. If Ostrovec is selected as the site of NPP, the 300 km zone will cover a significant part of the territory of Lithuania. In chapter 7 of the report the suggested ways of the monitoring organisation are given only for the territory of Belarus. The report does not address the issue of protective measures and monitoring at the adjacent territory of Lithuania.
33. The EIA report doesn't contain any information about accident system and action programs of competent and rescue service authorities in case of accidents. The arrangements that will be implemented in the NPP also should be presented in the report. The protection actions for population in case of accidents could also be described.
34. It is very important to keep in mind that the arrangements for foreign announcements, communications in case of emergency situations and emergency response actions are the subjects of international agreements of governmental institutions responsible for nuclear safety and radiation protection, civil defense and emergency situations. In the EIA report it is not mentioned that the Republic of Belarus has signed International Agreement in case of emergency situation at the NPP and compensation in such case.
35. The information about the specific IAEA nuclear safety and radiation protection guides that were used as references during the preparation of EIA report should be provided.

36. The EIA report lacks basic geological data: geological maps, geological-tectonic cross-sections of the new NPP region, tectonical scheme of the analyzed areas and etc. The evaluation of faults and neotectonic vertical changes of the earth surface should also be given in the EIA report. Therefore the conclusions regarding geological conditions can't be proved.

37. Please clarify if there will be any thermal load into Neris (Vilija) river. If yes, the dispersion of thermal load should be modeled and the results should be given in the EIA report. This issue is very important as thermal pollution can have significant impacts on flora, fauna especially cold-water species, benthos and other water organisms of Neris (Vilija) river. Moreover, during the preparation of monitoring program, this important aspect should also be taken into account. Please describe what studies will be included in the monitoring program.

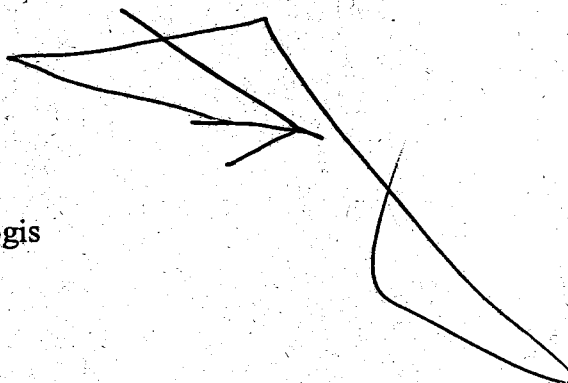
38. Please describe in detail what technology will be used to supply industrial water from Neris (Vilija) river to the NPP. The EIA report shall include river water balance computations and runoff characteristics. Water usage for the cooling of the NPP and water losses due to evaporation shall be evaluated. The EIA report shall include thorough hydrologic analysis of Neris (Vilija) river at the two alternative locations for surface water intake. The report should include at least average multiannual discharges (Q average, Q_{80} %, Q_{95} % m^3/s), and 30 days minimum discharges in summer-autumn and winter seasons (Q average, Q_{80} %, Q_{95} % m^3/s) and ecological discharge. In the EIA report should be given short information on measures which will be taken to ensure that thermal and hydrologic regime of Neris river will not be changed, the pollution will not be increased and the quality of Neris (Vilija) water will not be reduced.

39. Exploitation of the planned NPP can change hydrological characteristics, thermal regime and water quality of the Neris (Vilija). Taking into account that Lithuanian part of Neris (Vilija) river is Natura 2000 area, which is established for protection of salmon, otter, river lamprey, sculpins, spined loaches, chanka bitterling and other fish species and that Lithuania implements special action plans to restore and protect the resources of salmon and salmon trout species, the Belarus must ensure that implementation of the NPP project will not worsen the condition of Neris river.

Summarizing the above comments, we would like to note that preliminary EIA report lacks important information; many of the provided conclusions are not grounded. As a result, the preliminary EIA report can be treated only as a scoping document (EIA program). Therefore the public hearing in Lithuania will be organized after the receipt of final EIA report with the answers to our comments. Taking into account the requirements of the Convention on the environmental impact assessment in a transboundary context (Espoo Convention), the Party of origin shall ensure that the opportunity provided to the public of the affected Party is equivalent to that provided to the public of the Party of origin. Therefore, the summary of the final EIA report and information of possible transboundary impacts of the planned activity should be translated into Lithuanian language. Final position of Lithuania will be submitted after the public hearing. We would also like to express our interest to organize consultation meeting after the submission of our final position.

Yours sincerely,

Dr. Aleksandras Spruogis
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7 May 2010

No. (10-3)-D8- 4486

**REGARDING LITHUANIAN POSITION ON ENVIRONMENTAL IMPACT ASSESSMENT
DOCUMENTATION FOR THE CONSTRUCTION OF THE NUCLEAR POWER PLANT IN
THE REPUBLIC OF BELARUS**

Dear Mr. Vitalij Kulik,

We appreciate the willingness of the Republic of Belarus to co-operate in the process of implementation of nuclear energy projects in Belarus. The Republic of Belarus has provided documents of the environmental impact assessment (hereinafter referred to as "EIA") of a nuclear power plant planned to be constructed in Belarus (in September 2009, Belarus provided an EIA report and its summary (in the English and Russian languages), in February 2010 – an EIA report summary, information on the likely transboundary effect, responses to comments of the Republic of Lithuania (in the Lithuanian language)).

We would like to remind that in September 2008, the Ministry of Environment of the Republic of Lithuania (hereinafter referred to as the "Ministry of Environment") on its own initiative informed the Republic of Belarus that Lithuania intended to participate in the process of transboundary environmental impact assessment of this project and requested to present information in compliance with the provisions of the United Nations Convention on Environmental Impact Assessment in a Transboundary Context (hereinafter referred to as the Espoo Convention). The requests for the provision of information were repeated in January and April 2009.

Upon the receipt by the Ministry of Environment in September 2009, according to provisions of the Espoo Convention, of a notification of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus concerning the initiation of the EIA of this project alongside with the EIA documentation, the Ministry of Environment forwarded this information to state authorities and higher education institutions and non-governmental organisations and requested to submit comments on it. Taking into account the comments received from state authorities and higher education institutions, the Ministry of Environment submitted on 15 October 2009 to the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus 39 comments and proposals of Lithuania on the IEA documentation and informed that the final position of Lithuania would be presented only following a public hearing of the EIA report in Lithuania, which may be organised solely upon the receipt of a part of the documentation in the Lithuanian language.

The requested documentation in the Lithuanian language received in February 2010 from the Republic of Belarus has been published on the website of the Ministry of Environment and

forwarded to state and local authorities, public environmental protection organisations and higher education institutions alongside with information on a public hearing of the EIA report to be held and a request to submit comments on the EIA documentation to the Ministry of Environment by 8 March 2010.

A public hearing meeting on the EIA report was held on 2 March 2010 at the Faculty of Physics of Vilnius University. In addition to representatives of the Republic of Belarus, the meeting was attended by approximately 80 representatives of the public, non-governmental organisations, higher education institutions and state authorities. On the eve of the meeting, representatives of non-governmental organisations organised a protest during which leaflets were distributed urging to oppose the construction of the nuclear power plant in the Astravets region. At the meeting, representatives of the ordering customer of the proposed economic activity (the public establishment "Дирекция строительства АЭ") and the company "Белнипэнергопром", which had drafted the EIA documentation, informed of the course of the project, the results of the EIA and replied to the questions of the participants of the meeting. The comments and questions of the participants of the meeting were mostly linked with the proper choice and evaluation of alternatives in respect of a site for the nuclear power plant; the safety of the nuclear power plant; management of radioactive waste; actions in the event of a major accident; the thermal and radiological impact on the Neris ecosystem; the adverse impact of the nuclear power plant on the Lithuanian population as a result of exposure to radiation. The participants of the meeting proposed to abandon the construction of the nuclear power plant in the Astravets region and select an alternative location as the proposed economic activity would be carried out at a distance which is less than 50 km from Vilnius, the largest city in Lithuania and the capital of the country, and in the event of an accident a large number of residents would be adversely affected by radiation.

We regret that Belarus' representatives were not sufficiently well prepared for the public hearing regarding the environmental impact assessment report in Lithuania. As the members of the delegation had failed to provide a quality translation to the Lithuanian language, public representatives interrupted the reports being delivered by representatives of the Belarus delegation on several occasions and stressed that inappropriate information of the public constitutes a violation of its rights. It should be noted that, in compliance with the recommendations provided by the Guidance on Public Participation under the Espoo Convention, the translation burden and related expenses must be borne by the Party of origin according to the "Polluter Pays" Principle. Having regard to this circumstance, the participants of the meeting resolved to extend the time limit for submission of comments until 31 March 2010. Moreover, the Belarus delegation made a promise to translate into Lithuanian all the reports (presentations) delivered by the delegation so that they could be published on the website of the Ministry of Environment. The minutes of the public meeting is available on the website of the Ministry of Environment (<http://www.am.lt/VI/files/0.613767001268057762.pdf>). We would like to point out that the Ministry of Environment has received only a poor translation of a part of the reports delivered, and we have not received the reports (presentations) themselves yet. For these reasons, the public hearing should be considered as not having been held, therefore we request to repeat the public hearing meeting of the EIA report in Lithuania. It should be noted that a repeat public hearing meeting is also requested by the non-governmental organisations, which had provided comments and the public.

The Ministry of Environment has received 18 written comments from the public, non-governmental organisations, scientists and institutions. The Institute of Physics of the Republic of Lithuania has formed a work group and carried out an expert evaluation of the EIA of the Belarus nuclear power plant. The results of the expert evaluation and other comments are provided on the website of the Ministry of Environment (<http://www.am.lt/VI/index.php#a/9819>). Public activists have organised the signing of an electronic petition (<http://www.e-peticija.lt/peticija/42/ne-baltarusijos-ae-statybai-vilniaus-pasoneje>) against the construction of the nuclear power plant in the vicinity of Vilnius. The petition has so far been signed by over 23 000 people. Upon taking into consideration the received comments and the responses provided by the Ministry of Natural

Resources and Environmental Protection of the Republic of Belarus to Lithuania's remarks and having regard to the opinion of the country's public, the institutions and organisations concerned, the Ministry of Environment is hereby presenting the position of the Republic of Lithuania on the environmental impact assessment of the project of construction of a nuclear power plant in Belarus:

According to provisions of the Espoo Convention, an environmental impact assessment must include consideration of alternatives (no-action, locational and technological). During the EIA all alternatives must be assessed equally thorough. Prioritisation of one or another site should be substantiated in an environmental impact assessment report, which is possible solely conducting a thorough analysis of the considered alternatives. It must be pointed out that the EIA report contains only an analysis of the Astravets site. At other two sites mentioned in the EIA report (Kukshinovo and Krasnaya Polyana), the construction of the nuclear power plant is evidently impossible due to the karst processes taking place in their territory. According to the legal acts of the Republic of Belarus in force, the building of nuclear power plants at such localities (*a response to the remarks presented in the letter of the Ministry of Environment of the Republic of Lithuania of 15 October 2009*) is forbidden. This implies that only one locational alternative is examined, rather than the three alternatives, as claimed in the EIA report. The analysis and comparison of technological alternatives are not given adequate attention either.

It is absolutely unclear which selection criteria have served as a basis for selection of these three alternative locations and whether the surveys for selection of suitable sites for the building of the nuclear power plant were done according to the IAEA safety requirements "Site Evaluation for Nuclear Installations", NS-R-3, and other international recommendations.

Any specific site might be given priority solely upon considering all available alternatives. In this case, information must be provided on the potential impact on the elements of the environment by each of the site under consideration and the possible extent of the impact must be compared. The degree of risk of all the sites and its acceptability must be evaluated. According to the fourth safety principle of the IAEA (*Fundamental Safety Principles, SF-1, IAEA, 2006*), the radiation risks to which the nuclear installations and related activities give rise must be outweighed by the benefits that they yield in the course of their operation. The calculations done by the scientists of the Institute of Physics of the Republic of Lithuania (*Expert Evaluation of the Nuclear Power Plant in Belarus (2010), Annex 5*) show that in the event of a severe accident and under unfavourable conditions, the health of the residents of Vilnius and surrounding areas is exposed to a real and unacceptable threat. Construction of a nuclear power plant at such a close distance from Vilnius, the largest city of the Republic of Lithuania and its capital, would pose an unjustifiable high risk posed by this facility to Lithuania.

The final choice of the site should be made solely upon performing an in-depth assessment of the site from the safety perspective. Such an assessment covering geological, geophysical, emergency preparedness and other issues must be performed in line with the current good international practice.

Summary of comments on the issues of importance for the environmental impact assessment report in relation to the planned construction of a nuclear power plant in Belarus:

Geology. The report lacks geological, seismological, and seismo-tectonic data. A reference is provided to the document "Report on a Feasibility Study of the Construction of a Nuclear Power Plant in the Republic of Belarus (1588-PZ-PIZ. Principal Explanatory Note, Part I)", but this document has not been made available for familiarisation and evaluation. The statements presented in Tables 1 and 3 of the report concerning the tectonic structure and stability of potential sites, the seismic and tectonic activity, the amplitudes of horizontal and vertical movements of Earth's surface and the magnitudes of the projected and maximum earthquakes, the distances of the sites from seismic hazard zones and the seismic qualities of soil are not based on factual data

and/or documents. Having regard to the latest data of the seismo-tectonic research conducted by specialists of the Republic of Belarus and available to the Lithuanian Geological Survey (*Red. Sharov N.V., Malovichko A.A., Shchukin Y.K. 2007. Earthquakes and Microseismicity in the Context of the Current Geodynamic Developments of the Eastern European Plate. Petrozavodsk, the Karelian Research Centre of RAS, p. 381; Kaliningrad Earthquake, 2008, p. 151* (in Russian)), The Astravets site is located close to or even above the second-order (regional and/or local) active crack. Having regard to this fact, in the course of assessment of the environmental impact of a nuclear facility, such as a nuclear power plant and potential risks, exhaustive data must be available substantiating the potential impact of seismic activity and the resulting phenomena. Attention should be drawn to the fact that according to international practice, construction of a nuclear power plant over or in the vicinity of an active tectonic crack is prohibited (IAEA document "Site Evaluation for Nuclear Installations", NS-R-3, paragraph 3.7).

Reactor type. The EIA report does not provide an adequate justification of the choice of the reactor type. It indicates that the advantage of the selected reactor lies in the fact that the primary equipment and security systems having undergone tests in two reactors in China and that it is possible to return spent nuclear fuel for long-term storage or treatment to the Russian Federation. It is unclear whether other, and which, arguments have been considered when selecting the reactor type.

The presented information indicates that according to the project, the structures of the nuclear power plant would sustain a crash of only a light aircraft. This means that Belarus' nuclear power plant will not be protected against a crash of a large civil aviation aircraft. Taking into consideration the likelihood of terror acts, an increasing number of countries around the world (the USA, Finland, etc.), adopt the requirements for the projects of newly designed and constructed nuclear power plants to ensure adequate protection in the event of a crash of a large civil aviation aircraft. Lithuania also intends to observe such requirements. Belarus' decision on the construction of a reactor whose project does not ensure compliance with the mentioned requirements is not acceptable for Lithuania.

Regulatory body and its legal status. According to the second fundamental safety principle set by the International Atomic Energy Agency (*Fundamental Safety Principles, SF-1, IAEA, 2006*), an effective legal regulation and state management system must be created and maintained to ensure safety. Implementation of a project of such a scope as the construction of a nuclear power plant requires the creation and proper maintenance of a national regulatory body having a sufficient number of qualified personnel and considerable legal powers in the field of nuclear safety regulation. Such a body must be set up well in advance before commencing the implementation of the project, and the number of the personnel, their qualifications and the allocated material resources must be such that the body would be able to properly perform the nuclear power plant's safety assessment works, that is, to review the site assessment documentation, safety analysis reports, and to ensure the appropriate implementation of the project and a safe operation of the nuclear power plant. Moreover, it must be noted that the regulatory body should not depend exclusively on the conclusions of hired experts (external experts), but should also possess adequate own resources in order to be capable of not only appropriately formulating tasks for external experts and accepting works from them, but also perform, in a qualified manner, a review of the safety justification documents independent of the operating organisation and the nuclear power plant supplier and exercise state supervision of nuclear safety.

Implementation of the project. The procedure for licensing the nuclear power plant is unclear. A preliminary overview of the planning, designing and subsequent project implementation stages must be presented indicating the time limits for implementation and the specific stages of the project to be implemented, including safety assessment of the site, submission, consideration and evaluation of a preliminary safety analysis report.

Operation of the nuclear power plant. The data provided in the EIA report may be of relevance solely if the organisation operating the nuclear power plant acts in compliance with all technological and environmental protection requirements, if the nuclear power plant is managed by the qualified personnel and if environmental monitoring is performed, instant response is given to deviations from normal operations, the public is adequately informed, etc. As the EIA report relies extensively on

the legal acts of the Russian Federation and the opinion of Russia's authorities, there are doubts over the ability of the Republic of Belarus to ensure, by means of legal and practical instruments, the appropriate operation of this facility and to exercise its supervision at the state level, because in this case, Russia is the supplier of the nuclear power plant's technology and might be interested in selling the technology. In our opinion, the Republic of Belarus must take measures to perform an independent evaluation of the project of construction of the nuclear power plant.

Management of spent nuclear fuel and radioactive waste. The issues of radioactive waste management, which are of importance for the environmental impact assessment from the radiation protection perspective and which are closely related to the operation and decommissioning of the nuclear power plant planned to be constructed, are not given close attention. The EIA report must provide information on the decommissioning of the nuclear power plant and the final management (disposal) of accumulated radioactive waste clarifying the raising of funds for the decommissioning of the nuclear power plant and disposal of radioactive waste. An assessment of the economic impact of the nuclear power plant must also take into consideration the costs of the decommissioning of the nuclear power plant, management, storage and disposal of spent nuclear fuel and radioactive waste. A lack of the information permits a presumption that the Republic of Belarus does not have in place a clear strategy for radioactive waste management nor the legal acts regulating radioactive waste management. If repositories for radioactive waste are built near the nuclear power plant, their cumulative effect should be evaluated.

The manner of treatment of spent nuclear fuel remains unidentified. It must be indicated whether spent nuclear fuel will be considered as waste or valuable material, which will determine its management possibilities. It must be demonstrated that the Russian Federation is ready to receive spent nuclear fuel taking into account the technical capacities of this country and the legislation currently in force in the country. It should be pointed out that the laws of the Russian Federation prohibit disposal of waste of other countries, therefore the highly radioactive long-lived waste accumulated after treatment of spent nuclear fuel will be returned for disposal to the country of origin. The EIA report should discuss the plans of disposal of such waste.

Impact on the ecosystem and hydrological regime of the river Neris. The impact of thermal pollution on the flora and fauna (in particular salmon), benthos and other hydrobionts of the river Neris must be assessed. There is no information on the envisaged measures mitigating an adverse effect on the sensitive ecosystem of the river caused by heat pollution, hydrological regime, and polluted waste. Based on the information supplied in respect of the quantities of water required for the cooling process, it is not possible to evaluate the reliability of the data and the validity of the conclusions claiming that no adverse impact will be exerted on the river Neris and the qualitative and quantitative indicators of the water will not deteriorate.

The EIA report does not describe in detail the manner in which water will be taken from Neris river. It needs to indicate whether dam-construction measures will be employed, whether a water reservoir will be constructed. It should be noted that fish protection measures must be envisaged at the sites of collection and discharge of the water intended for cooling.

The report does not provide a detailed description of the impact of the used water returned to Neris on the river's chemical regime. As there are water intake sites (water extracting sites) located on the banks of the river Neris, and their resources are partly formed by the river water, the possible chemical changes of the river water will affect the quality of drinking water.

The report lacks information on the activity of the radionuclides to be discharged or released into water from the nuclear power plant. The values of potential radioactive pollution of the Neris water are presented indicating that the overall radionuclide (isotope Sr-90, Cs-137 and I-131) pollution of the water of Neris would amount to as much as 10 kBq/m^3 , however the report does not provide an assessment of the impact of tritium (H-3) and some other radionuclides (e.g., C-14) to be emitted in the course of the proposed economic activity on Neris river in the territory of Lithuania based on the calculations done according to radionuclide transport models. A rough assessment by presenting a reference to radionuclide pollution of the lake Drūkšiai as caused by the operation of the Ignalina NPP is not an exhaustive and substantiated response.

Assessment of the radiological impact on the population under normal operational conditions. The report does not provide an assessment of the potential exposure of residents to radiation. On the basis of monitoring data, it contains only the information on radionuclide

emissions from the reactors located in the Russian Federation and their activity. The report lacks an assessment of exposure of the population to radiation under normal operational conditions which would be based on specific calculations and which would take into account specific conditions of the nuclear power plant site and its surroundings as well as the design of the nuclear power plant and properly identified risk groups of the population. Account also needs to be taken of the fact that the reactor to be built has certain modification differences as compared with the similar reactors already in operation in the Russian Federation.

The response to the 15 October 2009 letter of the Ministry of Environment contains a reference to a document entitled "*Report on a Feasibility Study of the Construction of a Nuclear Power Plant in the Republic of Belarus. Study of Hydrological, Radiological, Ecological, and Land-Use Conditions in Relation to the Construction of the Nuclear Power Plant at Astravets and Verkhnedvinsk*". As this document cannot be accessed, its summary and results of calculations must be included in the EIA report.

Impact in the event of an accident. The Convention on Nuclear Safety and Safety Standard Series No GS-R-2 point out that when considering nuclear plant accidents, including low-probability accidents, causing discharges of radionuclides to the environment in the form of airborne or liquid effluents, all possible effects must necessarily be taken into consideration. The activity of radionuclide emissions to the environment in the event of a design and severe accident as presented in the EIA report makes up only a tiny part of the entire radionuclide activity accumulated in a reactor (hundredth parts of a per cent) and the report provides no substantiation of the selection of such a part of the activity. It is not clear why only the impact of Cs-137 and I-131 is assessed in the EIA report.

The zones in which emergency preparedness measures are to be applied must be determined individually for each site, because it depends not only on the specific features of the design of a nuclear power plant, but also on the site of the nuclear power plant and the peculiarities of its surroundings. It is incorrect to claim, in the absence of a specific technical project of the nuclear power plant, that application of emergency preparedness measures will not be necessary at a distance exceeding 800 metres from the nuclear power plant.

A description of potential accidents makes use of excessively optimistic evaluations of the radioactivity of the environment and plants. The statement that purification of a plant takes 20 days is inaccurate, because no account is taken of the average potential pollution of the plants. Subparagraph 5.1.3 of the EIA report claims that, in the event of a severe accident, the territory of the Republic of Lithuania will not be polluted by long-lived radionuclides, although subparagraph 5.1.2 presents model calculation data showing that, given a favourable wind, pollution of a certain area solely by Cs-137 could amount to as much as 19 kBq/m² (radiation background – 1.7 kBq/m²).

In our opinion, the assessment of consequences of severe accident was not based on the analysis of the worst meteorological and other modelling conditions, which could cause the transport of the released radionuclides to the territory of Lithuania as well as the dose exposure on the population. The consequences of the maximum design accident and severe accident must be assessed during different meteorological conditions and different seasons of the year.

In the event of a severe accident, it might be necessary to take protection measures in a densely populated territory of Lithuania, including the city of Vilnius, whose population currently exceeds 500 000 residents. The organisation and maintenance of emergency preparedness measures in such a territory will lead Lithuania to considerable expenses, and the implementation of the measures may be complicated having regard to the number of the residents and their distribution. Attention must also be drawn to the fact that the accident losses, whose scope in such a territory would be incomparably more extensive than a less heavily populated and industrialised territory, will have to be borne by Belarus.

Public opinion. The results of opinion polls and active participation of public organisations and virtual communities allow to claim that the Lithuanian public opposes the construction of the nuclear power plant in the vicinity of Vilnius, the largest Lithuanian city. A part of the public has proposed to develop alternative energy. On 26 April 2010, the anniversary of the Chernobyl disaster, non-governmental environmental protection organisations picketed at the embassies of

the Republic of Belarus and the Russian Federation and the Government of the Republic of Lithuania seeking to draw attention to the problems relating to nuclear energy.

CONCLUSIONS:

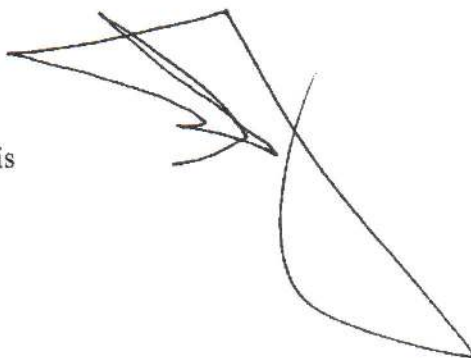
- 1) The environmental impact assessment of the nuclear power plant planned to be constructed is not sufficiently thorough, because the EIA report focuses exclusively on the Astravets site, which is not in conformity with the provisions of the Espoo Convention requiring a comparison of no-action, locational and technological alternatives. When conducting environmental impact assessment, all the alternatives must be assessed sufficiently comprehensive to enable the taking of a most favourable decision from the environmental and socio-economic perspectives.
- 2) Having analysed the provided environmental impact assessment documentation, we object the construction of the nuclear power plant in the Astravets district on the grounds listed in the comments.
- 3) We request to organise a repeated public hearing meeting regarding the environmental impact assessment report in Lithuania and declare our intention to participate in bilateral oral consultations regarding the position and comments.

ANNEXES:

1. Expert evaluation of the environmental impact assessment of the nuclear power plant planned to be constructed in Belarus (2010) performed by the Institute of Physics of the Republic of Lithuania.
2. Public comments.
3. Summary of comments to the replies provided by the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus in response to the remarks presented in the letter of the Ministry of Environment of 15 October 2009.

Yours sincerely,

Dr. Aleksandras Spruogis
Vice-Minister



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14.06.2010 № 13-16/1799-ВН
На № _____ ад _____

**Lietuvos Respublikos Aplinkos
Ministerija**

**A. Jakšto St 4/9
LT-01105 Vilnius**

The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus presents to the Ministry of Environment of the Republic of Lithuania its gratitude for the fruitful and constructive cooperation in the field of environmental protection.

The Belarusian Party has studied the documentation regarding the EIA report for the Belarusian NPP received with the letter of the Ministry of Environment of the Republic of Lithuania dated 07.05.2010 No. (10-3)-D8-4486 and has the pleasure to forward the responses enclosed concerning the Annex 3 of the above mentioned documentation.

The comments or questions left unanswered will be discussed during the consultation meeting on June, 18 2010.

Enclosure: responses on 14 pages.

Sincerely,

Deputy Minister

A.Lis

014464

REPLIES TO REMARKS (COMMENTS) OF THE LITHUANIAN PARTY, STATED IN THE LETTER OF THE MINISTRY OF ENVIRONMENT OF LITHUANIA № (10-3)-D8-4486 DATED 7 MAY, 2010 Г.

№	Remarks (Comments) of the Lithuanian Party	Replies of the Belarusian Party
1.	<p>The question is not fully answered. The Preliminary Report was send to Lithuania, but such kind of Reports is not presented in the explanation of the EIA procedure. The difference between Application of possible environmental impact and Report on environment impact assessment is not clear. Also it is not clear if the comments, remarks and suggestions of other countries will be taken into account. It will be very useful to know when the decision on site selection according to Belarusian legislation should be made. If site has not been selected yet, the radiological impact from all three alternative sites should be evaluated that was not been done in this Report (also see Question No, 5).</p>	<p>The procedure of carrying out of environment impact assessment in the course of development of preproject and project documentation has been described in Chapter 4 of "The Instruction of the Order of execution of Environment Impact Assessment of the Planned Economic and Other Activity In the Republic of Belarus. Has been approved by Resolution № 30 of the Ministry of Nature of the Republic of Belarus dated June 17, 2005". The comments, remarks and proposals of other countries will be taken into consideration in the course of upgrading of EIA. As it has been stated in EIA, the Ostrovets site has been chosen as the priority (basic) site, Section 4.1., p. 59. The Decision on the choice of the site will be taken in conformity with Law of the Republic of Belarus № 426-3 dated July 30, 2008 "On Use of Atomic Power".</p>

<p>2.</p>	<p>The question is not fully answered. The information about the licensing authority, requirements on licensing and other regulations is presented, but the licensing procedure, during which the main step - safety assessment of NPP - must be performed, is not explained. To understand overall view of authorization procedure of the new NPP the time schedule of different steps of authorization should be presented.</p>	<p>The requirements on licensing have been stated in Law of the Republic of Belarus № 122-3 dated January 5, 1998 "On Radiation Safety of Population".</p>
<p>3.</p>	<p>From the response of the Republic of Belarus to the Question No. 3, it became clear that Ministry of Emergency carries out state control in the field of nuclear and radiation safety, and that Belarus is still developing the legal and regulatory framework for licensing of a new nuclear power plant. The answers provided by Belarus to the Question No. 3 seem acceptable at this early stage of the new nuclear power development program in Belarus with that understanding that Belarus will:</p> <ul style="list-style-type: none"> • continuous work on development of the efficient, clear and transparent regulatory framework; • develop independent regulatory authority, that will implement itself and also will require from licensees and organizations providing technical support for development of the national nuclear power program such management systems, that are compliant with the international standards for 	<p>We agree with the assessment of our reply. Your remarks will be taken into consideration at the relevant stages of work.</p>

	<p>management systems, e.g. GS-R-3 IAEA;</p> <ul style="list-style-type: none"> improve and continue practices of communicating with interested parties within the state and with international community on nuclear and environmental safety related issues. 	
<p>4.</p>	<p>The answer contradicts to information presented in The Preliminary Report. According to the Preliminary Report the possibility of suffusion and karst processes activation is the only complicating factor for selection of Kukshinovo and Krasnaya Polyana sites. But in the answer to our request to complement and justify the priority of Ostrovet's site it is stated that according to the valid legislation of the Republic of Belarus it is prohibited to locate NPP on the territories where active karst has been detected or where there is a possibility to activate diffusion-karst processes. If it is true the site alternatives in the environmental impact assessment were not evaluated and the Ostrovet's site is not the priority site but only one site proper for NPP placing. Also it is not clear if research and prospecting works on choice of the site for placing of NPP were performed in accordance with IAEA Safety Requirements "Site Evaluation for Nuclear Installations", NS-R-3, and other guides on site evaluation for nuclear power plants.</p>	<p>In Section 4.1. of EIA* "Alternative Sites of Nuclear Power Plant Construction", p.59, it is stated that:</p> <ul style="list-style-type: none"> - for all three competitive sites there are no prohibiting factors (that is the factors, conditions which do not permit location of the NPP site as per the requirements of the standard documents. - At Krasnaya Polyana and Kukshinovo sites there is a possibility of activation of suffusion-karst processes which is the complicating factor. Engineering-geological and hydrogeological conditions of the Kukshinov site are complicated (there is no regularity in occurrence of soils of different structure and properties, there is pressure water the piezometric levels of which is being located close to the ground surface up to 1,5 m). - By the complex of factors which have great importance Ostrovet's site has an advantage before Krasnaya Polyana and Kukshinovo sites. - With regard to the above-stated, as well as with regard to the recommendations of the

		<p>International Atomic Energy Agency, as well as taking into consideration the significance of the issues of ensuring safety, the Ostroverts site has been determined as the priority (basic) site.</p>
<p>5.</p>	<p>The response concerns criteria of the NPP siteselection but no comparison of three sites on the degree of fabl influences on environment. The information about the possible impact of NPP on the environment in the 30-km zone around each of three potential sites: Krasnaya Polyana, Kukshinovs, and Ostroverts sites should be presented. The impact of siteson environment components should be compared.</p>	<p>As per TKP 098-2007 "Location of Nuclear Power Plants, basic Requirements to Composition and Volume of Survey and Investigation in the Course of Choice of the Nuclear Power Plant Site", pp. 10, 11, at the stage of the choice of the site the work on assessment of potential effect of the Nuclear Power Plant on environment has been executed at all three sites. The data have been represented in Section 4.1. "Alternative Sites for NPP Construction", Tables 3-5, pp. 47-58.</p>
<p>6.</p>	<p>The response is given only for the part of the questionrelated with the collective dose. Regarding to the risk acceptance, risks from all three potential sites were not analyzed and their acceptances for Lithuania were not evaluated. According to nuclear safety principle (presented within IAEA publication SF-1) facilities and activities that give rise to radiation risks mustyield an overall benefit. It is not clear how in the implementation of this principles risk and benefit for Lithuania will be taken into consideration.</p>	<p>In EIA there has been stated that the dose limits established for the power block of NPP-2008 and the target probability rates completely meet the requirements of the valld Russian Normative Documents (ND), the recommendations and the safety standards of IAEA, the International Advisory Group on Nuclear Safety (INSAG1 - INSAG12) and the requirements of the European exploiting organizations to the projects of the nuclear power plants of the new generation with the reactors of PWR type.</p>
<p>7. 8.</p>	<p>The response is accepted. We agree that comparison of various types of reactors is not the matter of EIA. But the description (fuel, coolant operating pressure, core outlet temperature, specific volume power, efficiency, containment) of various types of reactors (PWR, BWR, CANDU) is presented in the Report and conclusions about</p>	<p>In Section 9.5. "Grounds of Radiation Safety of the NPP", pp. 164-165, in Table 43 the values of the collective and average individual doses of radiation of the personnel of the NPP and the personnel of the organizations being employed for the works on the NPP</p>

9.	<p>positive characteristics of PWR reactors are based on this description. Some of conclusions (statement that doses from PWR reactors are minimal) should be justified, otherwise such statements are only declaration without any substantiation and give doubt about the reliability of the given information.</p> <p>In the Report the fact that the main equipment and security systems of this project are already tested on operating NPPs (2 power supply units in China) and possibility to return spend nuclear fuel for long-term storage and refinement on the territory of Russian Federation are indicated as the advantages of NPP-2009 project compare with other projects. It is also unclear if other features and criteria and which of them were analyzed in analysis of industrial reactors units. Also it is not clear the difference between data given in the Table 6 (heavy damage of core $< 5.8 \times 10^{-7}$, per reactor annually, and emergency limit radiation release from a reactor unit $< 1.0 \times 10^{-6}$ per reactor annually) and the Table 9 (calculated probability of heavy damage of core for all initiating events $< 10^{-6}$, per reactor annually, and calculated probability of limit radiation release in case of an accident beyond the design basis $< 10^{-7}$ per reactor annually). The meaning of these data should be explained.</p>	<p>in year 2005 are stated (Annual Report on Activity of the Federal Service on Ecological, Technological and Nuclear Supervision in 2005".</p>
10.	<p>The values specified in the response are characteristics of light airplane. It means that the Belarusian NPP of 2006 Project will be not protected against a wreck of heavy aircraft or military jet (military jets have the speed no less 1000 km/h i.e. about 3 times more than 100 m/s = 360 km/h). This fact is important taking into account the possibility of air terrorism.</p>	<p>Probability of heavy damage of core is $< 5.8 \times 10^{-7}$ 1/year reactor; Probability of frequency of the maximum accident discharge of radiation from the plant is $< 1.0 \times 10^{-6}$ 1/year reactor; The calculated values of the probability of heavy damage of core for all initiating events is $< 10^{-6}$. The calculated probability of achievement of the maximum accident discharge at out-of-design-basis accident is $< 10^{-7}$ 1/year reactor. The target probability rates established by the exploiting organization for the power block of the NPP-2006 (NPP-2006. Performance Specification on Development of the Basic Project. Year 2006): - Decrease of probability of the accidents on the power block with serious damage of core of the reactor up to the level of 10^{-6} 1/year reactor and more serious discharges outside the territory of the site for which urgent countermeasures outside the site are necessary, by the level of 10^{-7} 1/year reactor.</p>
10.	<p>The values specified in the response are characteristics of light airplane. It means that the Belarusian NPP of 2006 Project will be not protected against a wreck of heavy aircraft or military jet (military jets have the speed no less 1000 km/h i.e. about 3 times more than 100 m/s = 360 km/h). This fact is important taking into account the possibility of air terrorism.</p>	<p>Double containment shell of the Project of NPP-2006 provides for reliable protection of the NPP in case of aircraft falls and falls of great aircraft fragments, for example, engine.</p>

11.	<p>The response is accepted.</p> <p>The Report states that the spent nuclear fuel is to be removed to processing plants or to the supplier-country of the nuclear fuel. What legal measures will warrant that it will be implemented and spent nuclear fuel will not be stored and disposed in Belarus? If spent nuclear fuel will be returned to Russia, measures for safety of spent nuclear fuel transportation should be discussed, because this action is determined by operation of NPP and impact of this activity should be also evaluated.</p>	<p>Conclusion of the agreements between the Republic of Belarus and the Russian Federation on construction of the Nuclear Power Plant in the Republic of Belarus in conformity of which the spent nuclear fuel (SNF) will be transported to the Russian Federation. The SNF will be temporarily stored in the cooling pond situated inside of the containment. The technological radioactive waste of the NPP will be stored in the territory of the Republic of Belarus. The volume of this waste is up to 50 m³/year per one power-block. The technology of transportation of the SNF is well-tested. There is no case of impact of this procedure on environment registered in the world for all time.</p>
12.	<p>Only fact that radioactive waste management concept exists and now is being reviewed is mentioned but details on plans for radioactive waste storage and disposal in Belarus are not presented. The plans for management of decommissioning waste as well as operational waste in this concept should be considered. Also it should be taken into account that the financial resources for decommissioning and management of decommissioning waste should be envisaged before the operation of NPP starts.</p>	<p>The Project of NPP-2006 provides for storage of technological radioactive waste at the Nuclear Power Plant for 50-60 years. Construction of the local waste burial place is not connected with the Project of the NPP. Accumulation of the resources for decommissioning of the NPP is provided for.</p>
13.	<p>The response is accepted.</p>	
14.	<p>The Question No. 15 was based on English version of the EIA Report. During the ... (???)</p>	
15.	<p>The report does not provide a detailed description of the impact of the used water returned to Neris on the river's chemical regime. As there are water intake sites (water extracting sites) located on the banks of the river Neris, and their resources are partly formed by the river water, the possible chemical changes of the river water will affect the quality of drinking water.</p>	<p>The given question has been considered in Section 7.3.3. "Liquid Waste Discharge to Environment", pp. 141-143.</p>
16.	<p>The questions are not fully answered. According to the answer,</p>	<p>As per p. 5.10 of SP AS-03: "As the lower level of the</p>

	<p>sanitary standards SP AS-03 of the Russian Federation stipulate that population exposure to radiation as a result of discharges from a nuclear power plant under design or construction must not exceed 100 mSv/year, divided between airborne and liquid discharges (50 mSv/year each). However, according to page 177 of the environmental impact assessment (EIA) report on the Baltic Nuclear Power Plant (Leningrad Region), SP AS-03 indicate 10 mSv/year per each route of exposure. The 100 mSv/year dose limit in the event of disturbances in normal operation is mentioned in pages 173-179. Therefore, it is not clear what requirements are actually established in regulatory acts and which of the values are correct.</p>	<p>dose of radiation from separate radiation factor at optimization of radiation protection of the population in the mode of normal exploitation of the NPP the minimum significant dose equal to 10 mSv/year has been accepted". Point 5.11. SP AS-03: "With regard to the achieved level of safety of the NPP in the mode of normal exploitation (when the actual discharges of the NPP generate on each factor of impact the population radiation dose of less than 10 mSv/year) the radiation risk for the population at exploitation of the NPP is unconditionally acceptable (<10 mSv/year¹). In this respect the values of acceptable discharge levels (further – AD) being established by the present Rules are being calculated with regard to the dose of radiation of the population equal to 10 mSv/year".</p>
18.	<p>Since there is no possibility to study the indicated regulatory acts, it is not possible to get information on the effective requirements. According to the answer the levels set out in the regulatory act of the Russian Federation conform to international standards. However no substantiation for this assertion has been presented and the international standards that the levels conform to have not been indicated.</p>	<p>The reply is given in point 17.</p>
19.	<p>The presented answer to question 9 does not answer the question as it indicates the composition of low-activity waste and four radionuclides (Fe-59, Co-60, Cr-51 and Mn-54) in the first circuit. However, Table 24 of the EIA report provides data on radionuclide release into water bodies. The presented information on the nuclide composition of discharges into water should include data on predicted quantities of radionuclide (such as Cs-137, Cs-137, Sr-90, H-3, etc. discharges into water typical of a nuclear power plant as well as information on limit</p>	<p>The Project of NPP-2006 does not provide for liquid radioactive waste discharge to the environment.</p>

<p>20.</p>	<p>discharges established in regulatory documents. We agree that the average annual dose for population determined by NPP operation may be negligible compare with the dose from the natural radiation. However for purpose to show the impact of radiation determined by NPP, the dose for population should be evaluated. If this dose is forecasted in "The Report on Studying the Possibility of Placing of the Nuclear Power Plant in the republic of Belarus. A Complex of Works on Studying of Hydrology, Radiology, Ecology, Land Tenure Conditions at Nuclear Power Plant Placing on the Ostrovetsky and Verhnedvinsky Points", the summary of the evaluation and results of calculation should be presented in the Report. Unfortunately we have not access to the document mentioned in the answer and there is no possibility to find above mentioned results.</p>	<p>The works carried out at the stage of the choice of the site are represented in the previous reports. As per the calculations the maximum total value of the collective doses within 30-km zone at normal exploitation amounts to $2,87 \times 10^{-4}$ mSv. We think it is unreasonable to consider in the Report on EIA the effects which are not subject to quantitative assessment and in no way effect on the state of environment</p>
<p>21.</p>	<p>The necessity to model the processes of transfer of radioactive pollution in the course of normal operation mode of NPP is the decision of the authors of the EIA, but such modeling and its result ca serve as a tool to demonstrate the value of radioactive impact not only for Belarus but also for neighboring countries. The dose for critical group associated with NPP taking into account characteristics of the proposed site (dispersion of radioactive material discharged into air, surface water and groundwater) and design of nuclear installation should be present in the Report. In accordance with IAEA Safety Guide "Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants", NS-G-3.2, to evaluate the potential radiological impacts of normal radioactive discharges and accidental releases to neighboring countries the persons in the critical group may be located beyond national borders.</p>	<p>In Section 14.5 "Radiation Impact", pp. 406-461 the answer to this question is presented in the volume sufficient for EIA stage.</p>

22.	The question is not fully answered. There is no explained why maximum design-basis accidents (MDA) is not analyzed during the winter season.	The most dangerous is the summer scenario of discharge (the period of vegetation and use of greens). Out of the conditions of conservative assessment the summer scenario has been analyzed.
23.	The question is not fully answered. Only information about analyzed accidents scenarios and computer code that was used for simulation of radionuclides dispersion and deposition is presented. It is not clear why two different source terms were evaluated (^{131}I $1\text{E}+14$ Bq, ^{137}Cs $1\text{E}+13$ Bq for the 1 st scenario and ^{131}I $3,1\text{E}+15$ Bq, ^{137}Cs $3,5\text{E}+14$ Bq for the 2 nd scenario). The explanation why such source terms and summer season, such meteorological conditions (wind speed 1 m/s) and modeling conditions (boundaries of emission 21-25 m) for the evaluation were chosen should be given.	For the assessment of impact on biota, soil pollution discharge ^{131}I $3,1\text{E}+15$ Bq, ^{137}Cs $3,5\text{E}+14$ Bq has been used which corresponds to INES 6 (NNPP_EIAR_D2_Combined_Ru_200808_FINAL). The release height of 21-25 m had been taken with regard that transport lock is situated at this height. The expected radiation doses for population have been calculated at the maximum design-basis accident and out-of-design-basis accident on the power block. The discharge of radionuclides being taken into consideration for calculation at out-of-design-basis accident has been presented in Table 157, p. 449.
24.	More background information on the beyond design-basis accident scenarios and the graphic information on the fields of density of pollution of ^{131}I and ^{137}Cs radionuclides is given in the answer. But the graphic information on contamination levels of radionuclides is given only for the 1 st scenario. The Report should be supplemented with the graphic information on contamination levels of radionuclides for the 2 nd scenario also.	In EIA 2 most conservative scenarios have been presented: - the scenario of pollution of small area, Table 139, Figure 96, p. 417; The scenario of pollution of a great area, Table 140, Figure 97, pp. 418, 419.
25.	The question is not fully answered. In the answer there is no information about the results of calculation of pollution in the Republic of Lithuania under condition of BDB A with South-West emission trace and the worse meteorological conditions. It is necessary to have clear answer to assess a risk for population and to prepare emergency preparedness plans.	The scenario of pollution of a great area, Table 140, Figure 97, pp. 418, 419, has been presented for pollution of the territory of the Republic of Lithuania at the worst meteorological conditions.
26.	The question is not fully answered. If source term of Belarusian NPP in case of DBA is compared with maximum emergency emission of radionuclides from Novovoronezh NPP-2 and some	In the Project of the NPP-2006 the DBA is established on the basis of the achieved level of safety for the class of serious accidents on the block:

	<p>conclusions based on this comparison are made, it should be explained what does the term "maximum emergency emission" mean and when, for what purposes and by whom it is determined? Is it the same as the maximum permissible values of accident emissions (for project NPP-2006 these values are $1E+14$ Bq for ^{131}I and $1E+13$ Bq for ^{137}Cs)?</p>	<p>for earlier phase of the accident connected with leakages of FP (fission products) through leakinesses of double containment shell and bypass of the containment, at lack of power supply on the block : xenon-133- 10^4 TBq; iodine-131 -50 TBq; cesium-137 - 5 TBq. For intermediate phase of the accident after restoration of power supply on the block connected with discharge through the ventilation pipe: xenon-133-10^6 TBq; iodine-131 -50 TBq; cesium-137 - 5 TBq.</p>
27.	<p>The response is accepted.</p>	
28.	<p>The response is accepted.</p>	
29.	<p>Answering question 29, in which they were asked to assess the effects of tritium and other radionuclides on the River Neris in the territory of Lithuania, the EIA authors used data on the volumetric activity of radionuclides in Lake Druksiai and immediately rejected tritium due to its negligible effect. There is a table containing predicted maximum values for three radionuclides (Sr-90, Cs-137, I-131), with the obtained values compared with Russian Standard 2000. We consider the rejection and failure to assess H-3 to be incorrect for a few reasons: different type reactors, different type water bodies. It is also not clear why other radionuclides, such as Co-60, Mn-54 and other, have not been assessed. The table presents the maximum volumetric activity value of hundreds of thousands of times higher than the same volumetric radionuclide activity concentrations determined in Druksiai Lake, where radionuclide volumetric activity is becquerel or ten Becquerel per cubic meter of row. Neither the EIA report nor the answers to the questions provide information on potential radionuclide accumulation in bottom sediments and sites where</p>	<p>As per the Norms of Radiation Safety NRS-2000 the level of interference for H-3 is equal to 7700 Bq/l, for cesium-137 = 5,0 Bq/l, thus their ratio is equal to $7700:5=1540$. The ratio of cosmogenic and anthropogenic H-3 is equal to 10^4. The long-term observations of Youzhny Bug River (years 1988-2009), South Ukrainian NPP, have shown that concentration of H-3 is being varied within the limits 15-30 Bq/kg which is significantly lower than the level of interference. The water-moderated water-cooled power reactors-1000 are installed at the South Ukrainian NPP (small series = 2 pcs.) and RP-320 (one block). The liquid radioactive waste is being generated as per the technology. There has not been established overshoot of concentration of Co-60, Mn-54 and other radionuclides in the Youzhny Bug River. The Project of NPP-2006 does not provide for the liquid radioactive waste discharge to the environment.</p>

	such accumulation may occur, which may also be in the territory of Lithuania.	
30.	The response is accepted.	
31.	The response is accepted, the corrected value should appear in the Report.	The given value (25 km) is being used in the Report.
32.	The response is accepted. In Chapter 5.4.1 of the EIA Report, it would be useful to refer to the "Technical Report of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus and the Ministry of Environment of the Lithuanian Republic on cooperation in the field of monitoring and information interchange about a condition of transboundary surface water" dated April 10, 2008 and to provide some key information from this report.	
33.	Information about accident system and action programs of competent and rescue ... (???) ... *	The plans of accident system and action programs of competent bodies are being worked out.
34.	Additional information is presented, but the complete answer is not given. If the procedure and the system of urgent notification of the neighbouring countries in case of an accident have been developed by the competent organizations as part of the project of the Belarusian Nuclear Power Plant, this procedure and system should be described. Also information about laws, conventions, civil liability, compensation for nuclear damage should be added. Agreements on Urgent Notification about	The issue on conclusion of the Agreement on Urgent Warning of the Nuclear Accidents and Cooperation in the Field of Radiation safety is not the subject of EIA. The draft of this Agreement is at the stage of consideration of the Parties.

	<p>Nuclear Accidents and Cooperation in the Field of Radiation Safety with Poland and Ukraine are mentioned. We would like to notice that it is very important that such agreement with Lithuania will be established also.</p>	
35.	<p>Specific IAEA nuclear safety and radiation protection guides that were used as references during the preparation of EIA report are not provided. Chapters 1.3 <i>Basic normative documents</i> and Chapter 9. <i>References</i> don't include any IAEA nuclear and radiation protection guides.</p>	<p>Section 20 "List of Reference Normative Documents and Literature", pp. 501-511.</p>
36.	<p>The report lacks geological, seismological, and seismo-tectonic data. A reference is provided to the document "Report on a Feasibility Study of the Construction of a Nuclear Power Plant in the Republic of Belarus (1588-PZ-PIZ, Principal Explanatory Note, Part I)", but this document has not been made available for familiarisation and evaluation. The statements presented in Tables 1 and 3 of the report concerning the tectonic structure and stability of potential sites, the seismic and tectonic activity, the amplitudes of horizontal and vertical movements of Earth's surface and the magnitudes of the projected and maximum earthquakes, the distances of the sites from seismic hazard zones and the seismic qualities of soil are not based on factual data and/or documents.</p>	<p>The given materials have been considered at the stage of the choice of the site, the resulting materials in the form of Tables 3-5, Section 4.1. "The Alternative Sites of the Nuclear Power Plant Construction", pp. 47-58, have been included in the EIA.</p>

37.	<p>The questions are not fully answered. The impact of thermal pollution on the flora and fauna (in particular salmon), benthos and other hydrobionts of the river Neris must be assessed. There is no information on the envisaged measures mitigating an adverse effect on the sensitive ecosystem of the river caused by heat pollution, hydrological regime, and polluted waste. Based on the information supplied in respect of the quantities of water required for the cooling process, it is not possible to evaluate the reliability of the data and the validity of the conclusions claiming that no adverse impact will be exerted on the river Neris and the qualitative and quantitative indicators of the water will not deteriorate. We would also like to point out that River Neris monitoring must be planned. Particular attention should be given to the monitoring of the temperature of cooling water discharged into the river. Therefore, there must be a monitoring program to facilitate regular monitoring of temperature changes, quantitative and qualitative water parameters of the River Neris. The presented information on the quantities of water used for cooling does not suffice for us to evaluate data reliability and validity of the conclusions that there will be no negative effect on the River Neris and qualitative and quantitative water parameters will not be affected. The question is not fully answered. The EIA report does not describe in detail the manner in which water will be taken from Neris river. It needs to indicate whether dam-construction measures will be employed, whether a water reservoir will be constructed. It should be noted that fish protection measures must be envisaged at the sites of collection and discharge of the water intended for cooling.</p> <p>There must be an automatic monitoring system in the River Neris to provide early warning of emergency cases and increased levels of prohibited discharges to our country.</p> <p>Information on ways to ensure that no radioactive substances are</p>
38.	
39.	

The given questions (37-39) have been considered in detail in the Report on EIA, Section 14.4 "Nuclear Power Plant Impact on Environment", pp. 379-406, and Section 18 "Proposals on Organization of the Program on Ecological Monitoring", pp. 486-497.

discharged from the cooling system into the natural environment, ground and surface water (particularly into the River Neris) must be provided. It is necessary to plan means and preventive measures to ensure that cooling water contaminated with radioactive substances does not pass into surface water bodies and no damage is done to the natural environment of Lithuania in the event of various accidents.

EIA - the Report on EIA of the Belarusian NPP which was placed at www.dsae.by 04.03.2010 is in chapter «NPP Ecology».

I hereby certify the authenticity of the translation with the original document. Translator V.P.Komarova



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9 July 2010

No. (10-3)-D8- 6627

Mr. Vitalij Kulik
 First Deputy Minister
 Ministry of Natural Resources and
 Environmental Protection
 of the Republic of Belarus
 10 Kollektornaya Street
 220048 Minsk

Copy:
 Embassy of Belarus in Lithuania,
 Embassy of Lithuania in Belarus

REGARDING THE RESULTS OF BILATERAL MEETING

Dear Mr. Vitalij Kulik,

We would like to thank you for the bilateral meeting regarding the environmental impact assessment (EIA) of the construction of the nuclear power plant in the Republic of Belarus, that was held on June 18, 2010. According to the understanding reached during the meeting, we would like to present our view on the outcomes and the overall EIA process:

During the meeting Lithuanian side was quite unexpectedly informed about the significant and numerous updates to the EIA report itself, without any official notice about this fact presented to the Lithuanian institutions beforehand. The EIA report, which is presently available on the project developer website, is four times more thorough both in size and in content, than the preliminary EIA report provided to the Republic of Lithuania in September 2009 for the analysis and comments of the responsible Lithuanian institutions and for public information. This fact proves that our statement of intent (see letter dated October 15, 2009) to consider the presented preliminary EIA report only as an EIA program (scoping document) and as a prerequisite for a final report to be developed later, and our request to organize public hearings in Lithuania only after detailed EIA report is presented, proved to be well-grounded.

According to the practice the competent authority may demand that a public awareness campaign aimed at informing the public with the EIA report is organised if the EIA report has been substantially amended, corrected or supplemented after its first campaign as a result of grounded conclusions of the relevant parties of environmental impact assessment and grounded requests for amendments or supplements to the report made by the competent authority.

We consider the EIA report substantially amended, therefore, we would like to kindly encore our request to the Belarus side to organize public hearing meeting in order to review and discuss the supplemented EIA report thoroughly in Lithuania, as the public access to the EIA documentation in its full scope has been unreasonably restricted.

Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (letter dated June 14, 2010, No. 13-16/2799 VN) has stated that additional comments and answers to the questions of the Lithuanian side, that were omitted in the official correspondence will be provided in course of the envisaged consultations.

However, we would kindly like to remind that in the course of the abovementioned meeting none of the requested essential additional information on the alternatives, especially on site selection criteria was provided. It was only barely stated by the Belarus representatives that such criteria as geology, water (coolant) availability, absence of international air traffic lines were only mentioned as those taken into account, with the geology being identified as a main criterion in the decision taking to nominate the Ostrovetskaya as a priority site for the new NPP build.

No response has yet been received as to why such important criteria as, eg. impact on the population health (including collective radiation dose), population density, high cost and complexity of the emergency preparedness processes and others were not taken into account while giving priority to the site situated at such an vicinity to the most densely-populated part of the territory of the Republic of Lithuania, that includes the capital city of the State - Vilnius, where population currently exceeds 500 000 residents. It is in our common interest of the utmost importance that neighboring states would together realize that in order to avert the possible danger of a probable environmental threat, sides are strongly encouraged to notify and consult each other on all major projects under consideration that might have adverse environmental impact across borders, specifically objects like the NPPs. In this regard we would like to draw your attention that provisions of the Espoo Convention are thus considered by the Lithuanian side as a key element to bring together all stakeholders to prevent environmental damage before it occurs. We would kindly suggest those provisions would be fully employed and complied with in a full scope.

Taking into account all arguments presented above, we would like again to draw your attention to the fact that the bilateral meeting held on June 18 2010, due to the new circumstances, is to be considered by Lithuanian side as a preliminary discussion of the environmental impact assessment process, as required by the provisions of the Espoo convention and other international agreements.

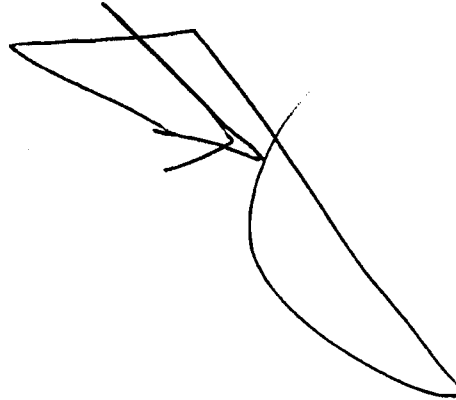
Due to the reasons outlined, specifically the fact that adequate evaluation of the new information provided during bilateral meeting was impossible to perform on such a short notice, Lithuanian side would like to kindly request Belarus side the following:

1. Officially submit the latest text version of EIA report alongside other relevant information presented at the meeting to the Ministry of Environment of the Republic of Lithuania;
2. Organize public hearings in Lithuania, ensuring the elimination of the numerous deficiencies and impediments that may occur during the public hearings, including technical deficiencies of the presentation and avoiding other insufficiencies and afterwards;

3. re-convene a bilateral meeting to discuss the matters of date, scope and duration of bilateral consultations, and, provided all the Lithuanian inquiries to the EIA documentation and presentations during public hearings are responded to in a clear and informative manner, to commence and effectively perform a consultation process according to the Espoo convention and other international agreements.

Yours sincerely,

Dr. Aleksandras Spruogis

A handwritten signature in black ink, consisting of several overlapping loops and lines, positioned to the right of the name 'Dr. Aleksandras Spruogis'.

Vice-Minister

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DEPARTMENT OF ENERGY OF THE REPUBLIC OF BELARUS
PROJECTING SCIENTIFIC AND RESEARCH REPUBLICAN UNITARY
ENTERPRISE
"BELNIPIENERGOPROM"

**JUSTIFICATION OF INVESTMENTS INTO NUCLEAR POWER
STATION CONSTRUCTION IN THE REPUBLIC OF BELARUS**

BOOK 11

EVALUATION OF IMPACT ON THE ENVIRONMENT

1588-ПЗ-ОИ4

PART 8

EIE REPORT

Part 8.1. NPS Description

EXPLANATORY NOTE

(Edition 06.07.2010)

Director

Rykov A. N.

Deputy Director

Bobrov V. V.

Chief Engineer of the project

Strelkov A. I.

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DEPARTMENT OF ENERGY OF THE REPUBLIC OF BELARUS
PROJECTING SCIENTIFIC AND RESEARCH REPUBLICAN UNITARY ENTERPRISE
"BELNIPIENERGOPROM"

**JUSTIFICATION OF INVESTMENTS INTO NUCLEAR POWER STATION
CONSTRUCTION IN THE REPUBLIC OF BELARUS**

BOOK 11

EVALUATION OF IMPACT ON THE ENVIRONMENT

1588-ПЗ-0И4

PART 8

EIE REPORT
(Edition of 06.07.2010)
ANNEX

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of the Republic of Belarus
10 Kollektornaya Street
220048 Minsk
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18 March 2011 No. (10-3)-D8-2613

**REGARDING LITHUANIAN POSITION ON ENVIRONMENTAL IMPACT ASSESSMENT
DOCUMENTATION FOR THE CONSTRUCTION OF THE NUCLEAR POWER PLANT IN
THE REPUBLIC OF BELARUS**

Dear Mr. Vitalij Kulik,

In response to your letter of 11 February 2011 No. 13-16/816-BH providing to us so called final EIA report for the Belarusian NPP document, we are sending Lithuanian position and questions regarding this document.

We are concerned, that despite the absence of fulfilled procedures required by Espoo Convention (properly prepared EIA report, organisation of requested public hearings and consultations) it seems that the site for construction of the planned NPP has already been chosen, the digging and other preparatory works have started and it is declared that the final EIA report has been submitted to the affected parties. We would like to draw your attention, that this is already a violation of Espoo convention procedures. We are confident that on 11 February 2011 the provided document can't be considered as the final EIA report, because the officially submitted Lithuanian requests to provide clear answers and essential additional information and fulfil other obligations under Espoo Convention are in general ignored by Belarusian authorities.

Furthermore, the submitted document itself raises doubts. It is stated that the EIA report was prepared in accordance with data of 6 July 2010, however, more recent information related to Lithuania such as the letter of the Ministry of Environment of the Republic of Lithuania dated 9 July 2010 is mentioned, in addition there is no any indication that there was any response to the request re-convene public hearings in Lithuania and bilateral consultations. It should also be noted that due to the poor quality of the document itself and its poor English translation, it was impossible to clearly understand and evaluate the presented text: the terminology used in the text doesn't correspond to internationally accepted one (used in the documents of International Atomic Energy Agency (IAEA), in the IAEA Glossary (IAEA Glossary, 2007) or in other international legislation); there are a lot of unexplained abbreviations; the resolution of presented illustrations is very low.

The provided document is not corresponding with the IAEA and Espoo requirements nor by the content and scope, neither by the quality of the analysis. Therefore, taking into the quality of the document, it can't be considered as the final EIA report.

Having analysed the submitted EIA report for the proposed nuclear power plant in Belarus, with regret we conclude that the questions raised by Lithuania in the letter of the Ministry of Environment of the Republic of Lithuania dated 7 May 2010, which were repeatedly expressed during the bilateral meeting held in Minsk on 18 June 2010 haven't been answered. Further analysis of the only and already selected site in Astravec is unqualified and missing basic information. EIA report still lacks important information on site selection criteria; there are no explanations why such important factors as the population density and vicinity to the most densely-populated part of the territory of the Republic of Lithuania that includes the capital city Vilnius have been ignored.

The report also fails to provide equal and thorough assessment of the alternatives, as it is focuses exclusively on the Astravets site, which is not in conformity with the provisions of the Espoo Convention requiring a comparison of no-action, location and technological alternatives. Moreover, there are no answers to the questions regarding the assessment of selected sites in accordance with IAEA Safety Requirements "Site Evaluation for Nuclear Installations". The report hasn't been supplemented with any additional geological, seismological and seismo-tectonic data, although such information is necessary for proper comparison of the location alternatives.

Issues related to the long-term safety, such as planning of decommissioning, radioactive waste and spent nuclear fuel management and final disposal are not properly addressed in the report. Safety substantiation concerning the possible crash of a heavy aircraft is not presented, although the assessment of such terror event is a very important issue when planning to construct the nuclear power plant close to the border of Lithuania and its capital, where the population currently exceeds 500 000 residents and the distance to the planned NPP is less than 50 km. The modelling assumptions used for assessment of radiological impact in the event of a design and severe accident are imprecise and unjustified. Also it is still unclear how the assessment of the radiological impact on the population of Lithuania under normal operational conditions was carried out. The report lacks an assessment of exposure of the population to radiation under normal operational conditions and in case of accident for other two sites analysed in the report. Moreover, the provided information about the early warning of other states and communication in the case of accidents as well as the exchange of radiological monitoring data is insufficient.

Another important issue, which is not thoroughly addressed in the EIA report, is the possible impact on the ecosystem and hydrological regime of the river Neris by the exploitation of NPP in Astravec site. There are no conclusions about a negative impact of change of hydrological regime, thermal, wastewater pollution on the sensitive Neris river ecosystem and no information is provided on the concrete envisaged measures to mitigate possible adverse effects on the ecosystem of the river caused by different types of pollution.

Taking into account the presented arguments, we urge the Republic of Belarus to submit comprehensive and well-grounded answers to all the questions raised by Lithuania regarding the EIA for the Belarusian nuclear power plant project, to organize public hearings in Lithuania and the Lithuanian-Belarusian bilateral consultations in accordance to Espoo convention. Lithuania is of the same position as it has been stated in Ministry's letters of 7 May 2010 and 9 July 2010 - we object the construction of nuclear power plant in Astravec site.

We have to state, that we haven't noticed any Belarussian attempt to consider Lithuania's position and requests in preparing the EIA report. As Lithuania is to be the most affected party in the project of Belarussian NPP, we request once again to respect our position.

We believe that the Republic of Belarus shall be in compliance with all international regulations regarding environmental requirements, nuclear safety and radiation protection, specifically with Espoo Convention and Convention on Nuclear Safety (provisions provisions of Article 14 and 17 of the Convention on Nuclear safety require a detailed evaluation of a proposed nuclear installation on individuals, society and the environment before the construction of a nuclear installation) therefore, we once again call to perform a comprehensive analysis of other suitable sites for the construction of NPP (alternate sites) as it is required by the Espoo Convention.

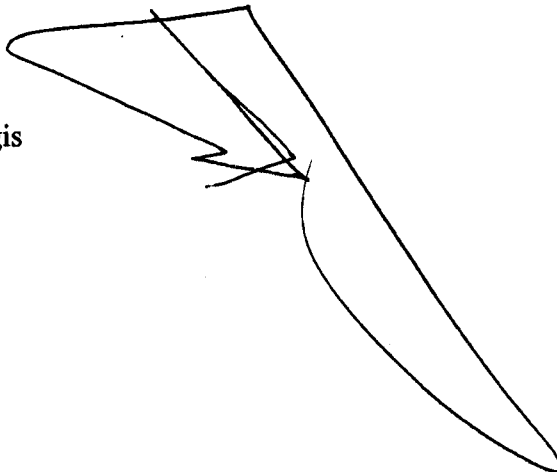
We would like to note, that EIA report will not be considered as final and EIA procedure will not be considered completed, unless these requirements are fulfilled.

We would like to draw your attention to the fact that according to the provisions of Espoo Convention final decisions regarding the site selection for construction of the Belarusian NPP shall be taken and any construction works shall be started only after the evaluation of the outcome of EIA including the comments of the affected Parties and the outcome of consultations under Espoo Convention with the affected Parties. It should be noted that the Party of origin shall provide to the affected Party the final decision on the proposed activity along with the reasons and considerations on which it was based.

Please find enclosed comments of Lithuanian authorities on the latest version of EIA report, which haven't been answered yet, 6 pages.

Yours sincerely,

Dr. Aleksandras Spruogis
Vice-Minister

A large, stylized handwritten signature in black ink, consisting of several overlapping loops and a long, sweeping tail that extends downwards and to the right.

Comments by Lithuanian authorities to the submitted EIA report

18-03-2011

No.	Comments
1.	<p>The updated EIA Report was presented, but most of Lithuanian comments were not taken into consideration. The environmental impact should be evaluated from all three alternative sites that was not done in the Report. Only more information on evaluation of radiological impact in the case of normal operation and accidents is presented in the Report for Ostrovets site. However, the worst scenario and the worst conditions in the modelling of radiological consequences should also be analysed (see comments No. 18-25 and comment No. 7).</p>
2.	<p>The information about licensing procedure during which the safety assessment of NPP will be performed is missing. To understand overall view of authorisation procedure of the new NPP the description of different steps of the authorisation and time schedule of these steps was requested by Lithuanian State Nuclear Power Safety Inspectorate (VATESI).</p>
3.	<p>Chapter 4.1 states that at the beginning 74 sites were chosen, 20 of them were rejected based on the criteria not mentioned in the report. From the rest sites 3 alternatives were chose for thorough evaluation, although the exact criteria are also not mentioned. The comparison of those 3 alternatives provided in the tables No. 3-5 is not based on quantitative criteria (except for the presence of karst processes). From the table 3 it can be concluded that greatest seismic hazards are in Astravo site. The data in this table also raises doubts whether the alternatives were objectively compared using geological and seismologic criteria (such assumption is made taking into account the lithology of aeration zone. It is also stated that for all sites there are factors indicating that the construction of NPP is not favorable in these sites, therefore it is unclear why these factors were not taken into account during site selection procedure.</p>
4.	<p>Chapter 13.1.1 gives only abstract description of the Quaternary horizons-subhorizons. Information on the Quaternary geological cross section and information about the tectonic structure and its development shall be added.</p>
5.	<p>It is not clear why in the chapter 13 it is stated that the maximum projected earthquake in the vicinity of Ostrovec site is only of 6 magnitude value, as from the provided data it can be seen that the earthquake of magnitude value 7 is probable. Moreover, the evaluation of seismic level was based on 1997 years data, which doesn't reflect the situation after the earthquake in Kaliningrad region in 2004.</p>
6.	<p>The question if research and prospecting works on choice of the site for placing of NPP were performed in accordance with IAEA Safety Requirements "Site Evaluation for Nuclear Installations", NS-R-3, and other IAEA guides on site evaluation for nuclear power plants is not still answered by Belarus side.</p>

	<p>It is not clear which methods have been applied to assess the density and spreading of population, whether have been taken into account the population density in Vilnius (1382 people/km²) and in the region of Vilnius (41.6 people/km²). Please provide more information about analysis of the external events (earthquakes and surface faulting, meteorological events, flooding, geotechnical hazards, etc.). The existence of capable fault shall be analyzed and the analysis of the capable fault shall be submitted in the Report.</p>
7.	<p>The analysis of possible radiological impacts of NPP on the environment is presented only for Ostrovec site. The report does not hold such information on other potential sites and does not compare the impacts of sites on the components of environment when the comparison of alternative sites by the degree of adverse effects on the environment should be a major factor in the final selection of the site. The impact of all alternatives sites on environment components should be evaluated and compared, results of evaluation should be presented.</p>
8.	<p>In accordance with IAEA Safety Requirements "Site Evaluation for Nuclear Installations", NS-R-3, the combined effects of the site and the installation shall be such, that the radiological risk to the population associated with accident conditions, including those that could lead to emergency measures being taken, will be acceptably low. The risk from all three potential sites were not analysed and their acceptances for Lithuania were not evaluated.</p>
9.	<p>The additional information on all features and criteria and which of them were analysed in analysis of industrial reactors units is not presented. It seems that the main advantages of NPP-2006 project compare with other projects were only the fact that the main equipment and security systems of this project were already tested on operating NPPs (2 power supply units in China) and possibility to return spent nuclear fuel for refinement on the territory of Russian Federation. Although it should be pointed out that the laws of the Russian Federation prohibit disposal of waste of other countries, therefore the highly radioactive long-lived waste accumulated after treatment of spent nuclear fuel will be returned for disposal to the country of origin. The EIA report should discuss the plans of disposal of such waste.</p>
10.	<p>The EIA Report does not contain safety substantiation concerning the possible crash of a heavy commercial aircraft or of high-speed military aircraft. The evaluation of the impact of such terrorist event is very important when construction of the nuclear power plant is planned in the vicinity to the most populated part of the territory of the Republic of Lithuania, that includes the capital city Vilnius, where population currently exceeds 500 000 residents and that is less than 50 km from the proposed site. It is necessary to analyze and include the information needed for safety assessment of an aircraft crash in accordance with IAEA Safety Guide NS-G-3.1.</p>
11.	<p>The additional information about spent fuel handling and storage is not presented. The legal measures for assurance that spent nuclear fuel will be transported to the supplier-country shall exist. Also the safety of transportation of nuclear fuel shall be assessed and shall be taken into consideration in the implementation of the project.</p>
12.	<p>The requested additional information on the planning of the nuclear power plant decommissioning, management and final disposal of radioactive waste and spent nuclear fuel is not provided.</p>
13.	<p>The assessment of decommissioning of nuclear power plant lacks economic and financial dimension. It is not clear who will be responsible for dismantling of nuclear power plant and management of radioactive waste. It should be clarified how the funds for decommissioning will be collected and managed.</p>

14.	<p>It is not clear where the repositories for final disposal of radioactive waste will be constructed. If there are plans to build them near the nuclear power plant, their cumulative effects shall be assessed in the report.</p>
15.	<p>From information in Section 10.1, it appears that one of two options: liquidation (delayed dismantling) or unit burial without dismantling will be chosen for decommissioning of the nuclear power plant. In the first case the reactors would be dismantled in a few decades, after natural decrease of radioactivity. The second option, which is technically feasible, needs a good preparation in advance. The engineering barriers shall be constructed, the role of natural barrier shall be evaluated and the safety of such decision shall be demonstrated. Those barriers must be included in the technical design project of the NPP. Moreover public should be informed, which of two options will be chose before the construction of the NPP.</p>
16.	<p>The table 15, which showed the "Agreed value of gross discharge" and "Actual data" of total gross discharges into atmosphere" is not presented in this Report. The term "Agreed value of gross discharge" is still unclear. Please, explain the term "Agreed value of gross discharge". Who has established the given values? In what document and for what conditions the given values are presented? Please, explain, to which concrete plant with PWR-1000 reactor the Actual Data relate? How will they correspond to the data for the planned Nuclear Power Plant which has higher power, and, probably, has another design, different equipment and technology?</p>
17.	<p>The limits on discharges that are in force in Belarus are not given, the information how the allowed level of releases to atmosphere and water will be defined are not presented in the Report.</p>
18.	<p>The doses for population living near the border of Lithuania and in Vilnius, contribution of various radionuclides and various ways of irradiation into the total dose is presented, although the selection of the critical group and assessment of radiological impact on population wasn't carried out as recommended by the IAEA Safety Guide, No. WS-G-2.3. The population exposure evaluation is based only on the radioactive discharges monitoring results of the similar reactors operating in Russian Federation.</p>
19.	<p>Modeling of radioactive contamination spread during normal operation was not done and transboundary radiological impact of the Belarusian nuclear power plant has not been analyzed. Information about annual dose as a function of distance and direction up to 50 km should be presented for all three sited. A useful way for demonstration of relative impacts on the Belarus and affected countries would be to calculate the collective dose from normal operations in each state. This can then be weighed against the relative benefits from the Belarusian NPP to each state.</p>
20.	<p>Chapters 14.5.4.1, 14.5.4.2, 14.5.3.3 The conditions of evaluation of radiological consequences in case of the maximum design-basis accident (MDA) are presented during the winter (according to meteorological data of March 17 2009) and summer (according to meteorological data of May 9 2009) seasons. It should be justified why the winter and summer seasons differ only about 1,5 month. Also it is not clear why the more conservative conditions in the modelling of radiological consequences have not been evaluated. These parameters of the model, used in calculation, and meteorological conditions should be justified: 1) the height of the surge (0 m.); 2) the category of the atmosphere stability in summer scenario (D category instead of F category in the Table 145). 3) duration of the surge; 4) period of model making. Also should be explained why:</p>

21.	<p>1) Table 147 and Table 148 present results of doses calculations for summer scenario but these results are different in both tables; 2) graphic information presented only for winter scenario and there is no such information for summer scenario. Chapters 14.5.3.1, 14.5.3.2, 14.5.3.3</p> <p>The explanation why two different scenarios with different activities of released ^{131}I and ^{137}Cs were evaluated and why such source term were chosen for simulations of radionuclides dispersion and deposition is not presented in the Report. The explanation why such source terms and only summer season for the evaluation of radioactive contamination were chosen should be given, also the evaluation of results presented in the tables (Table 139 and 140) and figures (Figure 96 and 97) and conclusions on it should appear in the Report.</p>
22.	<p>Chapters 14.5.3.1, 14.5.3.2, 14.5.3.3</p> <p>The results and graphic information on the fields of density of pollution of ^{131}I and ^{137}Cs in the both cases (pollution of small area and pollution of large area) and two scenarios (^{131}I 1E+14 Bq, ^{137}Cs 1E+13 Bq for the 1st scenario and ^{131}I 3,1 E+15 Bq, ^{137}Cs 3,5E+14 Bq for the 2nd scenario) are given in the Report. It is not clear why:</p> <ol style="list-style-type: none"> 1) in modeling the pollution of small area only the density of pollution of ^{131}I is presented in Figure 96; 2) in modeling of pollution of large area the density of pollution of ^{131}I and ^{137}Cs for the 1st scenario is presented in Figure 97? <p>The Report should be supplemented with the graphic information on contamination levels of ^{137}Cs and both radionuclides for the 2nd scenario.</p>
23.	<p>Chapters 14.5.3.1, 14.5.3.2, 14.5.3.3</p> <p>Doses for Lithuanian population were evaluated only in the case of the normal operation. Please provide information on doses evaluation for Lithuanian population in cases of design-basis and beyond design-basis accidents. The doses for population in Vilnius area shall be presented taking into account the conservative initial conditions as well.</p>
24.	<p>The evaluation of results presented in the tables (Table 139 and 140) and figures (Figure 96 and 97) and conclusions on it are not made and should appear in the Report.</p>
25.	<p>Chapters 14.5.5.1, 14.5.5.2</p> <p>It is not clear if the appropriate conditions were applied in dose evaluation for population. For comments on evaluation of the doses for population due to the maximum design based accident see comments on question No. 22.</p> <p>Regarding the evaluation of the doses for population due to the maximum design based accident it is not clear why:</p> <ol style="list-style-type: none"> 1) results for two winter scenarios are presented in the Report; 2) results for summer scenario are not presented in the Report; 3) the height of the surge is 0 m.; 4) upper and bottom edges of the emission from 21 to 25 meters; 5) what duration of the surge and period of model making were used in evaluation of doses for population? <p>These modelling assumptions should be justified. Also it is not clear what is presented in the Figure 118 and Figure 119, as it is stated that in the both pictures the dose of irradiation over the thyroid gland with the zone near the NPP at undersigned emergency is showed.</p>

26.	<p>Chapters 14.5.5.1, 14.5.5.2 It is not clear if the appropriate conditions were applied in dose evaluation for population. For more comments on evaluation of the doses for population due to the beyond design-basis accident see previous comment.</p>
27.	<p>Chapter 15.4 Doses for Lithuanian population were evaluated only in the case of the normal operation. Please provide information on doses evaluation for Lithuanian population in cases of design-basis and beyond design-basis accidents. Although the doses for population living near the border of Lithuania and in Vilnius are presented it is not explained how this dose evaluation during normal operation was done and how the radiological impact of the Belarusian nuclear power plant for population of Lithuania has been analyzed. Such information should be described in the Report.</p>
28.	<p>The requested additional information about the long-term protective measures and monitoring at the adjacent territory of Lithuania is not added. It should be presented in the Report.</p>
29.	<p>Information about accident system and action programs of competent and rescue service authorities, the arrangements that will be implemented in the NPP in case of accidents is not added. It should be presented in the Report.</p>
30.	<p>In the report it is mentioned that in the case of a possible severe accident at the nuclear power plant it may be necessary to adopt protective measures (iodine prophylaxis) in the territory of Lithuania (50 km from Ostrovec site). Taking into account the fact that impact assessment of the severe accident presented in the report is preliminary and the results of peer review of this assessment carried out by Institute of Physics of Lithuanian Physical Science and Technology Centre, which indicate the necessity of long-term application of protective measures in the territory of Lithuania, is not possible to conclude that there will be no need to apply additional protective measures in the territory of Lithuania. Therefore, the relatively small distance from the proposed site to the most densely populated part of Lithuania (the population of capital Vilnius currently exceeds 500 000 residents) shall be an important criteria for site selection.</p>
31.	<p>The procedure and the system of urgent notification of the neighbouring countries in case of an accident is not described. Also information about laws, conventions, civil liability and compensation for nuclear damage is not added. It should be presented.</p>
32.	<p>Norms of Radiation Safety NRB-99/2000 are referenced in the environmental impact assessment report; however they are not in force from 1 September 2010, when new edition - NRB-99/2009 was issued. Changes of intervention levels have occurred as well. We would like to ask to pay attention to the fact that Environmental impact assessment report was presented to Lithuania on 11 February 2011, which means more than 5 months after changes in legislation.</p>
33.	<p>The documents presented on 14 June 2010 by the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus to the Ministry of Environment of the Republic of Lithuania provide an answer to the questions 19 and 29 where is stated that “The project of NPP-2006 does not provide for liquid radioactive discharges to the environment.”. However in presented environmental impact assessment report it is mentioned that debalanced waters from the controlled access zone of NPP will be discharged and output of radioactive substances to the hydrosphere is possible. However, this possibility and possible pollution of the environment under the conditions of normal operation of NPP is not evaluated in the report. It should be clearly stated what doses in the territory of Lithuania will be caused by individual radionuclides released into water during normal operation of the nuclear power plant, since their contribution to the exposure is expressed only as a percentage (15.4 sections 131 to 134 fig.).</p>

34.	The dimensions of doses presented in table 178 differ from the table 159. Dose values presented in figure 124 contradict to the ones showed in figure 125.
35.	The report lacks information on precautionary measures to be taken in order to prevent the pollution of surface water bodies and harm to Lithuanian environment in the cases of various severe accidents.
36.	More detailed description about cooling water reservoirs' location, type, parameters and water uptake technology must be provided. Furthermore, there is no information about fish protection measures at the sites of uptake and discharge of the water intended for cooling.
37.	<p>The data provided in the environment impact assessment is mostly about the pollution degree without analyzing the impact on the environment. There are no conclusions about a negative impact of change of hydrological regime, thermal, wastewater pollution on the sensitive river ecosystem. In our opinion, it is necessary to describe how the pollution will affect flora, fauna, benthos and other hydrobionts of the river Neris.</p> <p>We would also like to point out, that a negative impact on hydrobionts (flora, fauna, benthos) and the whole ecosystem of the river Neris at low flow, summer drought and spawning periods must be considered in more detail. Moreover, it is necessary to provide concrete measures to mitigate negative impact and to substantiate their adequacy and effectiveness in the Report.</p>
38.	<p>Expert evaluation of the environmental impact assessment of the nuclear power plant planned to be constructed in Belarus performed by the Institute of Physics of the Republic of Lithuania was not taken into account. Most of the requests to present more thorough and grounded information were ignored, the presented assessment of the impacts in the case of accident at the nuclear power plant is non-conservative. Having analysed the current version of EIA report, the scientists of Institute of Physics provided additional comments:</p> <ol style="list-style-type: none"> 1) It is stated that the population density in the area around the plant shall not exceed 100 people/km². Such requirement is met only for the territory of 25 km radius. Within the territory of 50 km radius (including capital of Lithuania Vilnius), the population density is very close to the threshold value (> 90 people/km²). Taking into account the fact that number of inhabitants and population density in the big cities is increasing, this criterion in the near future will be exceeded. 2) (Tables 133 and 134). The chemical pollution of the Neris river will increase and as a result the pollution for certain pollutants will exceed permissible limits. This can't be seen as an acceptable situation. 3) In the current version of the EIA, the Neris river discharge is compared with the information from 147 and 148 references. Since references 147 and 148 are scientific publications, the purpose of such comparison is not clear – these documents do not have any regulatory validity, therefore can be used only for illustrative matters.