Questions of the Authorization of the Usage of the Environment, State, Results, Public Hearings

Antecedents

The stipulation of the extension of the operating time of the units of the nuclear power station determined by the legislative regulations is getting the environmental license. In this article we are going to deal with the questions and the state of the environmental authorization.

Before the Paks Nuclear Power Plant was put in operation, no environmental effect-study had been prepared in today's sense, since the legislative regulations of the '80s did not know and use the present methodology of the environmental effect-investigation. The first attempt to prepare a complex environmental effect-study was the preliminary environmental effect-investigation concerning the expansion of the nuclear power station in 1997, joining the capacity tenders invited by the Hungarian Electricity Works. The most important experience of the effect-investigation was that the available previous data, the industrial environmental monitoring being in accordance with the legislative and official expectations, and the special environmental examinations form a good basis for the preliminary environmental effect-investigation, but to make the environmental effect-investigation successful, in some fields research programs are necessary to be started that go beyond the concrete legislative expectations. Accordingly - realizing that the proper treatment of the questions of environmental protection is going to be the stipulation of every future strategy - the power station had started its complex program of environmental protection being in accordance with the up-to-date requirements, complementing the industrial data collecting before the preparation process of the extension of the operating time was started. Those days the probable expectations of the future had to be taken into consideration, rather than the operative requirements of that time, so in order to be professionally appropriate, in determining the main issues of research the operator asked the opinions of the competent official and professional circle and the leading experts and establishments. On one hand the goal of the program was to produce data records that are appropriate for evaluating the long-term environmental effects of the nuclear power station, and for examining the correlation between the environmental characteristics to be evaluated together, and in some questions for developing the methodology of the effect-investigation. In determining compass we took the measurements made continuously carried out by the operational organizations of the company and the other issues connected to the categories, covered by the tasks arising from the nuclear safety authorization into consideration as well. In all categories the time of data collecting is the professionally well-founded length of record needed to be representative, that is two or three years or seasons, vegetation periods. In connection with the issues that do not require technical preparations the data collecting was started in 2001, while in other fields it was started in 2002.

Examined fields and main statements of the company seat characterization

Program that forms the basis for the environmental effect-study

To get familiar with the company seat and its environment, detailed examinations have been carried out as the integral continuation of the already mentioned program, especially in the field of investigating the nuclear environmental effects. To examine the environmental effects, several reports and studies - that formed the basis for the authorization - have been prepared. The main statements of these are the following:

Conditions and changes of surface waters

According to the results, the effects of the used waters of the nuclear power station along the section of the river manifested themselves only in the changes of the water temperature, and to a small extent in the changes of the dissolved oxygen concentration (minimum) and the oxygen saturation (maximum). The contamination shows a level corresponding to the average contamination of the Danube, or it is only slightly higher than the average value. Beyond the examinations concerning water chemistry we also carried out the investigation of indexes with the help of which the other possible effects of the warmed up cooling water of the nuclear power station can be detected as well. According to the measurements the contamination of the sediment was only slightly higher than the average contamination of the Danube - because of the non-radioactive contamination that can be attributed to the nuclear power station. In the sediment the extent of the accumulation of the contamination is not harmful for the creatures living here.

The twenty-year operation of the nuclear power station has not caused detectable accumulation of radioactivity in the environmental elements till now. The reason for this is the low levels of emissions and the dynamic equilibrium occurring in the environmental elements.

Effects of the nuclear power station on the utilization of the surface and underground waters

We investigated the effects of the warmed up cooling water of the nuclear power station on the water quality of the Danube in 8 sections (the first is above the power station, and the eighth is at Mohács) with chemical, radiochemical, bacteriological, phytoplankton and zooplankton surveying, as well as with aquatic macroscopic surveying concerning the head of animals and the fauna of fish. We determined the probable area of affection of the jet of heat in the monitoring section. On the basis of the results of the probes of the right bank a slight change can be detected in the water quality, occurring because of the blending. Using the results we carried out a modeling process concerning that how long it takes for a possible form of contamination to reach the involved drinking water bases. The results of the modeling show that in the cases of the existing water bases the time periods of reach are more than 14-20 days in every case.

The bed of the Danube and the conditions of the river wall (hydrometric measurements)

The modeling and measurement processes with the present restrictions do not expect changes in the river bed. The measurement and modeling results are important

from the point of view of operation as well, since knowing the results the methods of operational intervention can be made more exact.

Local climate in the environment of the nuclear power station

On the basis of the results of the investigations we can say that the power station does not emit either heat, or moisture in a different way or proportion compared to an averagely built up inland town with average population.

The results of the numerical and statistical modeling carried out to investigate the meteorological effect of the thermal loading of the Danube show that the effect stays below three natural effects (the regional differences of the climate, the daily changes of the weather, and certain concurrent microclimatic differences) to which the ecosystems could have adapted till now. The representation of the modeling results clearly shows that the effects of the nuclear power station are obscured by the effects caused by the differences of the vegetation and the topography.

Characterization of the environment of the nuclear power station with aerial and satellite photographs

On the basis of the maps concerning the usage of the region and the tables concerning the investigation of the changes, prepared on the basis of the satellite photographs, we evaluated both the most important characteristics of the basic conditions, and the changes. The investigation of the changes that has been carried out basically concerns the vegetation covering the surface and the usage of the land. According to the results, most of the forms of the usage of the region did not, or slightly did change in the investigated time period.

Where we detected a change, that usually was great or very considerable, and positive from the point of view of the effect of the power station, since the presence of the power station resulted in some kind of an organized state in its environment. Among the forms of the usage of the region the areas used for sports, leisure time and holiday activities and the areas of mixed forests increased to a demonstrable extent; however, the areas of terrestrial swamps decreased. The results show that the cultivation in large terraces decreased, while the cultivation in small terraces increased, and this change can unequivocally be connected to the time period following the change of the regime; while at the same time the presence of the closed gardens shows a decreasing tendency, and the presence of the areas spontaneously getting covered with forests shows an increasing tendency.

Examination of the blending of the cooling water in the Danube with aerial thermo visional measurements

On the basis of the results of the thermo visional examinations, one of the main statements is that the jet of heat always goes down along the right bank of the river, and it goes into the areas among the reefs as well. The blending happens in the 4-5 km long section following the place of the pouring in to the most extent, to an extent of about 95%. In the photographs the effect of the jet of warm water can be seen about 30 km below the pouring in, but the difference is only slight.

Exemplary bio-monitoring examinations

Within the frames of the program, the characterization of the wider area giving place to the power station from the point of view of the flora and fauna has been carried out. On the basis of the visual monitoring that has been carried out we can say that the possible environment polluting effects of the running power station cannot be detected in the vegetation.

Examination of the state of health of the people living in the environment of the Paks Nuclear Power Plant

The collecting and processing of the data concerning the state of health of the people living in the environment of the nuclear power station has been carried out, as well as the evaluation of the results. On the basis of the summary we can say that in the whole of the investigated areas the appearances of tumors were rarer than in the reference population.

Determining the radiation load of the flora and fauna

On the basis of the results, both place of living types (aquatic and terrestrial environment) fulfilled the requirements, namely the activity concentration of the biota gave results that were below the reference values as far as the different place of living types are concerned, and most of the activity concentration of the biota is caused by the radioactive isotopes occurring in the nature.

Tritium Content of Water Base Samples

Samples taken from rainwater and surface waters basically show tritium concentration accordant with that of globally and regionally collected samples.

Licensing Procedure

Following the arrangements mentioned above, in 2003 the power plant started the licensing procedure of the service time extension according to the 20/2001 decree. The environmental licensing of the service time extension is a two-step process, which consists of a preparatory and a detailed phase and provides an overall inspection of the environmental effects of the power plant. The process also accomplishes the controlled involvement of the public.

The preliminary environmental effect-study made on the basis of legislative measures and administrative requirements was petitioned the Lower Danubian Environmental Authority (Alsó-Duna-völgyi Környezetvédelmi Felügyelőség, Adv KÖFE) for assessment in April, 2004. In May 2005, the competent authority issued its act, which settled the preparatory phase of the licensing procedure and appointed to make a detailed effect-study.

During conducting the detailed effect-study, the legislative measure to effect-study changed, so besides the requirements already defined, the 314/2005 decree also had to

be kept in view. During the licensing procedure several legislative measures applied to documentation were modified, among which the most important was the modification of the 89/2005 decree determining the nuclear security requirements of nuclear establishments and related authority actions.

On the basis of the requirements mentioned above, the documentation titled *Units 1-4 of Paks Nuclear Power Plant–Service Time Extension of Paks Nuclear Power Plant–Environmental Effect-Study and Plain Summary* was handed in to the Lower Danubian Environmental Authority on March 13, 2006. Authority assessments were carried out between March and May, 2006. Demands for supplying deficiencies were not claimed by the competent authority.

According to the requirements of the legislative measure, the Lower Danubian Environmental Authority announced a public audience, which took place in the appointed rooms of Paks Vocational High School of Energetic (Energetikai Szakközépiskola, ESZI) on April 28, 2006. On the basis of comments on the preliminary environmental study made by the Energy Club (Energia Klub), news monitoring and frequently asked questions found in the forums of the homepage of the power plant, the most important subjects got determined during the preparation for the public audience. The audience started with short oral presentations of the realization of the service time extension of the power plant and the structure of the public company (KHT) given by the representatives and the constructor of the power plant. Presence of experts was provided by the power plant, but the nature of the questions asked did not call for the experts' contribution. The Environmental Authority invited all representatives of different special authorities who had taken part in the assessment, but there was no question put to them. Besides private persons, social and civil organizations, the Energy Club availed itself of the opportunity to express an opinion. All questions were answered at the spot.

In the audience the mayor of Kalocsa put in a claim for a public audience in Kalocsa. This claim was reinforced by a letter written to the Chief Executive of Paks Nuclear Power Plant, which informed the executive of organizing a local government audience and the need for the cooperation of experts of the power plant. As a result of this claim, a local government audience was taken place in Kalocsa on May 18, 2006. There, a detailed presentation of the service time extension of the power plant and public company (KHT) was given. Besides private persons, social and civil organizations, the Energy Club availed itself of the opportunity to express an opinion, which only partly touched on the main subject (service time extension) of the audience. All questions were answered at the spot. Besides the experts of the power plant, representatives of the Environmental Authority, the Hungarian Atomic Energy Authority Nuclear Security Management (Országos Atomenergia Hivatal Nukleáris Biztonsági Igazgatósága, OAH NBI) and the expert of the Social Controlling and Information Association (Társadalmi Ellenőrző és Információs Társulás), were invited by the local government of Kalocsa.

The Espoo Procedure

In spite of the fact that in the preliminary effect-study phase, the licensing authority found that the service time extension did not result in significant environmental effects perceivable over the Hungarian border, the international interest was more intense than it had been expected. The international law imposes strict conditions on processes related to environmental effects contingently detectable over the border. According to the Espoo Convention, independently on the environmental effects actually detectable over the borders, all the countries participating in the environmental effect-study have right to articulate an opinion and to ask for a legal procedure in the case of disagreement. Being aware these possibilities, Austria, Croatia and Romania took part in the licensing procedure.

According to the directions of the Espoo Convention, representatives of the three countries acted in consultations. The experts of Paks Nuclear Power Plant participated in public debates organized in countries joined the convention. As a result of the cooperation, the Espoo Procedure finished successfully in all three countries and each step of the procedure was recorded.

Following the national and international events of the licensing procedure mentioned above, on October 25, 2006 the competent authority permitted the 20-year service time extension of the units of Paks Nuclear Power Plant. The Energy Club Environmental Association (Energia Klub Környezetvédelmi Egyesület) has filed an appeal against the decision permitting the service time extension. The reconsideration of the appeal is still in progress.

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Elter Enikő, Dr. Katona Tamás, Rátkai Sándor, Kovács Ferenc