

Environmental Impact Assessment Report
for the Decommissioning of Units 1 to 4
at Kozloduy Nuclear Power Plant

CHAPTER 8

CONCLUSION

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8. Expert conclusions

This chapter contains summarized expert's conclusions, formulated on the basis of the detailed description and analysis of the environmental elements and key interaction between them to the assessment of the anticipated impacts on the environment and human health as a result from the implementation of the Investment Proposal for Decommissioning of Units 1 to 4 of Kozloduy Nuclear Power Plant.

The decommissioning process of Units 1-4 KNPP includes the following stage, Pre-decommissioning, Stage 1 and Stage 2 and Closure and site restoration stage.

The pre-decommissioning activities include: build of Size Reduction and Decontamination Workshop (SRDW), construction of three sites for Decay storage of transitional RAW and one site for conventional waste, road infrastructure, 300m railway and extended the existing conventional waste depot.

Stage 1 of decommissioning process includes the following phases: preparation of safe enclosure area, operation of safe enclosure area, and equipment dismantling out of safe enclosure area. Stage 2 of decommissioning process includes the dismantling in safe enclosure area and building free release of regulatory control for other purposes.

The closure and site restoration stage include the following activities: dismantling of the equipment not intended for further use; free release of the buildings and facilities remaining in operation; processing and taking out of all RAW from the site and bringing it to a condition suitable for nuclear purposes or other economic activities. Some building and underground communication will be stay for serving Units 5 & 6 KNPP.

8.1 Atmosphere

If the processes of materials decontamination are controlled and the adopted decommissioning technology for KNPP Units 1-4 in execution of the measures for prevention, mitigation or termination of the adverse impact on the environment from the implementation of the Investment Proposal is observed, negative impact on the atmosphere in the considered territory is not expected.

In the area of construction and dismantling activities, and especially during excavation works, disposing of land masses and after that during terrain restoration, insignificant microclimatic changes resulting from increase of dust in the air in regard to the lighting and thermal characteristics will be observed during the working day until the completion of the construction phase. The impact will be local (within KNPP territory), short-term, without cumulative effects on the atmospheric processes.

The activities related to dismantling of equipment in the reactor building and transportation of part of it to the Size reduction and decontamination workshop will be performed in closed premises equipped with filtering ventilation systems, so that the impact on the atmosphere will be insignificant.

The analysis of the Investment Proposal and of the possibility of pollution of the atmosphere in the KNPP 30-km area falling within Romanian territory shows that the waste products generated during construction and operation of the SRDW, the decay

storage sites for RAW, and the storage site for conventional waste will be many times fewer than during the period of normal operation of KNPP units. In this regard, significant negative impacts on the values of the meteorological elements and the state of the atmosphere are not expected. Considering the prevailing direction of the winds in the area, the probability of transmission of aerosols in the direction of Romanian territory is very limited.

In conclusion, it can be stated that if all technological and regulatory requirements are observed, the impact of the processes related to RAW treatment and conditioning on the atmosphere in the considered territory will be insignificant. Trans-boundary impact from harmful substances in neighboring countries is not expected. The application of the safety measures developed in the project will guarantee the protection of the surface layer of the atmosphere above the plant site and adjacent areas.

8.2 Air quality

After the removal of the nuclear fuel from the Units, no emissions of Radioactive Noble Gases - RNG (Kr, Xe isotopes), nor of short-live iodine isotopes (^{131}I , ^{133}I , ^{135}I) are expected.

The radiological impact on the critical individuals as a result of radiation by noble gases or inhalation of ^{131}I will be earthly negligible compared to the impact resulting from the respective discharges during normal operation.

Long-live aerosols emissions from activities that will be carried out during the Preparation of Safe Enclosure could be compared more or less with the ones during the period of long outage, with a reduction of the maintenance/inspection activities, but with an increase of the cleaning/decontamination activities and activities for conditioning of the radioactive waste.

If the technology is strictly adhered to and the decontamination and dismantling processes are strictly monitored, the emissions of radioactive gas aerosols can be expected to be within the permissible limits and the air pollution in the NPP area can be expected to be less than the pollution during normal operation and therefore the decommissioning can be implemented in a manner that is safe for the environment and for the public.

Source point harmful emissions into air during the decommissioning are expected to be the following facilities: the Facility for Treatment and Conditioning of Solid Radioactive Waste with a High Volume Reduction Factor (Plasma melting facility) and the Size Reduction and Decontamination Workshop, but they will be equipped with adequate filtration systems and for these reason the impact will be insignificant.

Diffuse source emissions (fugitive emissions) of dust are expected from the earth works and of gas aerosols from the internal combustion engines of the construction equipment, generated during the construction period. These emissions are assessed as short-time, temporary and localized as impact. These impacts are commonly with an extent radius of 50 m from the construction site borders at maximum.

Other emission from conventional sources are expected to be generated in result of metal cutting and waste transportation (CO_2 , NO_x and PM_{10}).

Based on the assessments made of the planned decommissioning activities and based on the experience of EWN [50], a conclusion can be drawn that the emissions of non-radioactive substances into the air during the processes of decommissioning of Kozloduy NPP Units 1 to 4 will not exceed the levels permitted by the legislative regulations. Transboundary transfer of pollutants is not expected.

8.3 Surface and ground water

The possible impacts on surface and ground water during the execution of the planned activities in the Pre-decommissioning (PD) stage of KNPP Units 1-4 are related to the increase of water consumption, mostly technological water used for cleaning, construction activities (wet method processes and others). The amounts, however, will be limited and will not be a problem for the KNPP water supply system, since the current water consumption is approximately a little over 50% from the allowed water quantities. This means that the water supply will continue from the same water sources and without changes in the issued permits for water use. The scope of this impact will be local, within the water extraction facilities (for ground water). Regardless of the insignificance of the impact, it will be negative and direct, with limited territorial scope and low level within the area of influence around the water extracting facilities. The impact will be temporary (only during the pre-decommissioning period) and short-term.

During the Pre-decommissioning (PD) stage of KNPP Units 1-4 waste waters will also be generated, mostly during cleaning. They will be contaminated mainly with suspended matter. The waste waters will not be a problem for KNPP sewage system, nor for the treatment facilities of the plant. The generated water flows will be collected and transferred to the treatment facility north of Units 1-4 and the treatment complex at the EP-2 industrial site, where they will be treated to the necessary level and then discharged in the Danube River through the MDC. Therefore, additional impact on the quality of the Danube water from the activities during this stage is not expected. Impact on ground water body *BG1G00000N2034* (Neogene pore water) is not expected either, because the possibly infiltrating small quantities of contaminated water will be retained in the comparatively powerful and with low filtrating properties aeration area, without reaching the ground water level beneath it.

The activities during Stage 1 of the decommissioning are related to Safe Enclosure preparation and operation, as well as dismantling of equipment outside of the SE area.

Stage 2 of the decommissioning includes dismantling of equipment in the SE area and release of the buildings from control to be used for other industrial purposes. Before the start of the Safe Enclosure preparation a number of activities are planned to reduce the potential hazards caused by the SE area.

In the period of final shutdown of the units, the activities associated with the removal of the liquid and solid RAW from their original storage places will contribute considerably to minimization of the impacts resulting from radioactive materials handling. The subsequent activities - transportation, temporary storage in adapted storage areas and premises and transfer to the facilities for treatment and ultimate conditioning - shall be done by means of equipment which is pre-tested for impermeability in terms of RAW leaks. Assuming that there is no damage to the storage area caused by the mechanisms for transfer of the RAW from their present

storage locations, the impact on the surface and ground waters resulting from the radioactive materials handling can be considered insignificant and in case of damage in the storage level measures for localization and repair of the damaged place is necessary.

The provision of suitably engineered RAW leak-proof mobile equipment for treatment and ultimate conditioning of the solid and liquid RAW, supplied to the decontamination site, reduces the probability of leaks during transportation of the RAW and additionally contributes to the reduction of the impact on the hydrosphere.

The effluent from the decontamination and washing of the equipment and buildings are considered to be liquid RAW which shall be concentrated and treated by cement-hardening conditioning.

Provided that compliance with all technological and regulatory requirements is ensured, the impact from RAW treatment and conditioning on the surface and ground waters will not endanger the ecosystems and public health in the concerned region.

For the protection of the surface and ground waters, the process waste water discharged into the hydrosphere must be made consistent with the fixed standards for water purity in terms of the content of non-radioactive and radioactive pollutants. At the time of finalization of the decommissioning activities, an improvement of the surface and ground waters quality will be observed in the concerned region.

As a whole, the liquid discharges into the environment resulting from the decommissioning of Units 1 to 4 of Kozloduy NPP will be considerably smaller in comparison to the period of operation of the units. The annual radiation rates due to them will be within the allowable limits with a sufficient safety margin. The decreased impact on the surface and ground waters can be considered to be a positive effect from the nuclear power units decommissioning compared to their operational period.

Among the positive impacts associated with the decommissioning, special attention must be paid to the elimination of the thermal output pollution of the Danube River resulting from the discharge of cooling water during operation.

Upon decommissioning completion amelioration of the surface and ground waters quality in the affected region will be observed.

Data from the monitoring of the surface and ground water in the Romanian territory from the 30-km area surrounding Kozloduy NPP do not show exceeding which can be associated with the KNPP operation. The technologies for decommissioning selected on the basis of the international experience and the adequate distribution of the decommissioning activities in time guarantee the limitation of the expected direct effects of the activities on the water quality within the allowable limits. Environmental impact is negligible and can not cause any transboundary impacts.

8.4 Land and Soils

The soils on the Kozloduy NPP territory and within the 30-km area are black-earth, alluvial, diluvia and grey forest soils. The most widespread are the black-earth soils. Their resilience to withstand anthropogenic impact is dependent on the nature of the activities undertaken. With regard to mechanical impacts such as civil works, earth

works, etc. their resistance is very low. With regard to pollution caused by inorganic and organic pollutants, however, they possess very strong resistance. Their buffer property is due to the favorable reaction of the soil dilution, the high content of the carbonates and their heavy mechanical composition. With regard to their resistance to radiation contamination, the favorable content of potassium plays an important role here. The grey forest soils are also classified as resistant.

During the period of decommissioning of Units 1 to 4 the potential sources of impacts on soils will be both non-radiological and radiological.

The activities on the border of the SE area will be carried out in closed premises and do not represent a threat for the soils of the NPP site as well as the adjacent lands. Considerable part of the activities within the SE area is not related to the generation of sources of the impact on the soils. The decontamination shall be carried out in closed premises. In case of efficient execution of the foreseen decontamination activities no impact is expected on the soils of NPP site as well as on the adjacent lands. After execution of the decontamination the possible sources for contamination of the soils are different waste, precipitates and service water for process activities.

During KNPP Units 1-4 decommissioning some liquid and solid RAW will be generated. The permissible limit for the liquid waste releases are admitted to be significantly lower than the limits during normal operation of KNPP Units 1 to 4 and this is fixed in the license for E-mode operation of these units. This means that the likely impact on the soils during the decommissioning will be much lower than during the period of normal operation.

Sources of conventional impact on the soils are mostly the activities related to the construction of new buildings, execution of earth works, and transportation of spoil material.

The impact on the soils resulting of the construction of the Decay Storage for Transitional RAW, the Size Reduction and Decontamination Workshop and the Site for Conventional Waste from Decommissioning depends on a number of factors. These parameters shall be precisely specified in the detailed design. In the construction phase the impact on the soils will not differ significantly from any other construction site. Impacts are mostly mechanical – such as the excavation or embankment works, stamping, sealing, isolation. Construction equipment is a source of dust and gas emissions of the internal combustion engines. Also, generation of surface flow on the construction site is expected as well as generation of waste- both municipal and construction. The effects on the soils will be intermittent – in the limits of the working day and till the end of the construction works. During this stage no significant impact on the soils and the adjacent lands is expected. The impact of this type is assessed as being a negative, local and long term impact and in the post decommissioning period it will be direct, positive and long-term benefit taking into account the reclamation and recycling.

Various types of conventional waste are sources of non-radiation impacts on the soils coming within the scope of the EIA. Their collection, transportation and storage must be implemented in accordance with the program developed, which must guarantee protection of the soils.

The period after the final shutdown of Units 1 to 4 is associated with the presence of gaseous and liquid emissions. It is assumed that the gaseous emissions shall not be at increased levels and that they shall not pose a threat for soil contamination. As for the residual diluted radioactivity from the decontamination of various rooms, equipment, etc., a water purification system is envisaged and the waste process waters shall not be a source of soils contamination.

The analysis of the likely sources of impacts on soils in connection with the decommissioning of Units 1 to 4 and with the post-decommissioning period allows us to make the assumption that the planned activities are not a soil contamination source.

After the completion of the decommissioning process, a reduction of radiological and non-radiological emissions into the environment (atmospheric air and water) is expected. No consequences for the land and the waters are expected. Transboundary transfer of pollutants is not expected.

8.5 Earth bowels

In the geological section of the area different lithotypes are observed, among which the Quaternary deposits are widespread. Typical physical and geological phenomena and processes are subsidence associated with loess material, landslide on the slopes, also typical for loess materials and swamping in the floodplains of the Danube River.

The probable impact on the geological environment and its stability in the various stages of the investment proposal has been assessed. It is important to note that the impact of dismantling machinery could not be estimated at this stage regarding the additional loading of the geo-environment. In general, the expected impact is negative, during which the quality characteristics of the substrate and the current geotechnical equilibrium position would be changed.

On order to specify the degree of impact, the physical and mechanical properties of the environment need to be evaluated in compliance with the existing seismic conditions in the facility area. The risk of unlocking physical geological processes and phenomena has been assessed. Such risk would exist in case of a shock (point) loading of the terrain resulting from disruption of the scheduled destructive activities or in case of accidents.

There is a risk of chemical and radioactive contamination of the geological environment in cases of accidents and incidents. The extent of this impact is rated as low, but it should still be considered.

The impact on the geological environment is assessed as negative, direct, and short-term during the dismantling work.

Strict compliance with the developed and adopted standard procedures for such projects is recommended in order to preserve the geological environment from radiation and non-radiation contamination. The control for the preservation of the surface and ground waters would contribute to the prevention of the risk of impact on the geological environment. In regard to the stability of the geological environment, development of a temporary monitoring for the period of dismantling works is recommended, which should control all changes in the quality parameters of the

environment. The monitoring should be reconsidered in cases of new substantial loading of the geological environment.

8.6 Landscape

The Kozloduy NPP territory has a complex horizontal landscape structure. Within this territory there are clearly outlined several types of landscape –“anthropogenic”, “forest” and “aquatic”. The resistance to impact of these landscapes is low. Their existence is determined by the human activity. The forest landscape is characterized by higher resistance thanks to the fact that it possesses capacity for self-regulation and self-recovery.

In the 30-km area around the Kozloduy NPP site the landscape diversity is manifested by the following types of landscape – “forest”, “meadow”, „agricultural”, „aquatic” and „anthropogenic”. The highly resistant forest landscape and aquatic landscape is formed by the natural water flows in the water catchments basins of the Rivers of Danube, Skat, Ogosta and Tsibritsa.

Significant role for the substance circulation in the landscape structure is played by the loess soil-forming materials and the carbonates-containing soils, which create migration barriers for the different pollutants including the radionuclides.

The decommissioning process involves construction works on the territory of the NPP site itself which however will not disturb the anthropogenic landscape. In the 30-km area around the NPP site construction works will not be carried out.

Provided that the decommissioning activities on the KNPP Units 1-4 are correctly executed, the Investment Proposal can be implemented without risk of landscape components contamination. Provided that the Conventional Waste Management Program at Kozloduy NPP is correctly implemented, adverse impacts on the landscape are not expected. It is not expected cumulative impacts on landscapes of the activities for the decommissioning of Units 1-4 of NPP "Kozloduy" operation of Units 5 and 6 of NPP "Kozloduy" and National Repository for radioactive waste in the absence of permanent sources of radioactive contamination. Transboundary effects are not expected.

8.7 Natural objects

Provided that Alternative 2 is chosen, that the requirements of the adopted technology for Kozloduy NPP Units 1 to 4 decommissioning and that the proposed measures for Investment Proposal implementation are strictly adhered to, the radiological status of the environment is expected to be kept and it is not expected that there will be adverse impact on the protected areas: PA Zlatiata, code BG0002009, under the Directive on the conservation of wild birds and PA Kozloduy Islands, code BG0000533, PA Ogosta River, code BG0000614, PA Skat River, code BG0000508, PA Tsibar, code BG0000199 under the Directive on the conservation of natural habitats and of wild fauna and flora. Eventual adverse impacts related to accidents with worsening of the radiological status would have only local character and are not expected to reach the territories of the Protected Areas. These impacts are with neglecting probability of occurrence and at this stage it is sufficient to be addressed in the updated and approved revision of the Kozloduy NPP Emergency Plan, covering also the activities and possible accidents during Units 1 to 4 decommissioning.

It is not expected cumulative impacts on natural objects from the operation of Units 5 and 6 of NPP "Kozloduy" and national repository for radioactive waste in the absence of permanent sources of contamination.

During decommissioning of KNPP Units 1-4 trans-boundary impact on the protected areas of the Romanian territory is not expected.

8.8 Mineral diversity

During the implementation of IP mineral resources will not be used. For this reason the impact of mineral resources is not expected. During the last stage closure and recultivation the non-radiation and radiation impacts to earth bowl is not expected.

8.9 Biodiversity

8.9.1 Flora

Provided that the adopted decommissioning technology during KNPP Units 1 to 4 decommissioning is adhered and the Alternative 2 is the adopted alternative, and that the proposed measures for prevention, reduction and possible elimination of the adverse environmental impacts resulting from implementation of the Investment Proposal (IP) are applied, no adverse impact on the flora and vegetation in the adjacent territories is expected.

It is not expected cumulative impacts on flora from the operation of Units 5 and 6 of NPP "Kozloduy" and national repository for radioactive waste in the absence of permanent sources of contamination.

During decommissioning of KNPP Units 1-4 trans-boundary impacts on the Romanian territory are not expected.

8.9.2 Fauna

On the basis of the anticipated impacts on the fauna in consequence of the Investment Proposal implementation, they are assessed as insignificant, mainly indirect or rising in case of accidents and force major, which can be prevented without obligatory application of special measures, except the respect of the best decommissioning practices during KNPP Units 1 to 4 decommissioning and at a condition to keep the already implemented prevention and monitoring activities.

During decommissioning of KNPP Units 1-4 transboundary impacts on the Romanian territory are not expected.

8.10 Cultural and historical heritage

Harmful effects on the sites of cultural and historical heritage in the 30-km area are not expected due to the fact that the decommissioning activities at all stages and the implementation of the supporting projects (such as: Size Reduction and Decontamination Workshop, Decay Storage Site for Transitional RAW and Site for Conventional Waste from Decommissioning) will take place within Kozloduy NPP site limits, where no cultural relics or archaeological findings were identified. During decommissioning of KNPP Units 1-4 trans-boundary impact on the cultural and historical heritage of the Romanian territory is not expected.

8.11 Harmful physical factors

During the implementation of the decommissioning activities, throughout the entire period a re-allocation of the existing residual activity will take place, which will change the location, the quantities and the radiation intensity within the operational site of Kozloduy NPP and in the environment (under some specific circumstances)..

Based on the analysis of the radiation status of the environment and the presented information, the impact of the ionizing radiation from the activities over the decommissioning period on the radiation gamma background can be forecasted to be insignificant provided that:

- On the reactor sites the zones with the respective control limits and permissible values of the gamma radiation, as well as their control values and permissible limits on the external walls of the rooms containing radioactivity are preserved;
- The restrictions of the gamma radiations will be observed both in and around the newly-constructed buffer and decay storage areas, as well as the limits on the capacity of the RAW storage equipment;
- An adequate biological protection is provided for the contaminated equipment taken out from the SE area, of the RAW and during their transportation;
- Beyond the reactor site and within the statutory zones for radiation monitoring the permitted limits for emissions of radioactive substances in the sewage waters and in the ground atmosphere layer should be observed.

A conclusion can be drawn that there will be no influence from the decommissioning and dismantling activities on the radiation gamma background and the environment as well as on Bulgarian territory as on the territory of Republic of Romania, if the above conditions are observed.

The impact from the ***non-ionizing radiation*** during decommissioning of the reactor will be limited within the borders of the sanitary protection zone and will be insignificant for the environment.

No additional impacts on the environment from non-ionizing radiation are expected from the implementation of the decommissioning activities according to the Decommissioning Plan, as well as based on the experience of EWN [50].

Noise impact in reference of the noise levels during decommissioning will be of permanent nature, progressively decreasing in time with temporary picks.

Increase of the noise levels will be perceived when there are ongoing activities with noise source at open air. Although the levels of the generated background environmental noise at the site of EP-1 will not exceed the defined statutory limits including for the adjacent settlement of Bulgaria and Romania.

Vibrations will be generated during the overall decommissioning, produced by the working equipment and facilities. Their influence will be of permanent nature progressively decreasing in time with temporary picks, limited within the scope of the EP-1 site and insignificant for the environment, including for the adjacent settlement of Bulgaria and Romania.

8.12 Waste and dangerous substances

During the decommissioning activities conventional and radioactive waste will be generated (solid and liquid). Based on the performed analyses and assessments, it can be stated that, if all technological and regulatory requirements are observed, the impact of the processes related to RAW treatment and conditioning on the environment and population will be insignificant. Transboundary impact from harmful substances in neighboring countries is not expected. The programs for management of RAW and conventional waste and the application of the safety measures developed in the project will guarantee the protection of the environment and population and the adjacent areas.

Non-radioactive waste that will be generated during implementation of the project do not differ in composition and classification of waste generated at "zero" option. Landfill for non-radioactive waste and has the capacity to absorb waste disposal from decommissioning of Units 1-4. Nevertheless construction of site for non-radioactive waste from the decommissioning of the units is planned.

The waste is separated during decommissioning and is directly submitted to specialized organizations where it is processed in accordance with the current laws. It can be concluded that if the measures planned in the updated Program for management of non-radioactive waste are observed, significant impacts are not expected. It is expected that if the valid permits and regulations applicable to work with hazardous substances and chemicals during execution of the decommissioning and dismantling activities are observed, the environmental impact will be insignificant. No trans-boundary impacts are expected.

8.13 Personnel and population health

All activities foreseen to be performed during decommissioning are conformed to the requirements for healthy and safe work conditions and for public health protection. Prophylactic examinations of the personnel are performed every year following strict annual time-schedule in the Occupational Medicine Service of Kozloduy NPP.

During the implementation of the activities in the preparatory stage of the decommissioning, the radiation impact on people as a result of noble gases exposure or inhalation of ^{131}I will be completely insignificant in comparison with the impact from the respective discharges during normal operation. The radioactive aerosols represent a tangible risk for internal irradiation during the dismantling works, which requires stringent personal dosimetric control and compliance with the regulatory requirements. The decommissioning activities are preliminarily planned and this includes elaboration of dismantling activities time-schedule, taking into account that for each decommissioning activity or group of activities in reference of its complexity a separate working package/procedure, containing detailed activity description is provided. Special attention deserves also the high level of safety culture in Kozloduy NPP and systematic application of the ALARA principle, minimizing the specific risk of occupational radiation exposure.

During the installation and construction works some of the working groups will endure exposure to general and local vibrations, metal aerosols, infrared and ultraviolet irradiation (welding operations) and dust inhalation. Concerning the

exposure to these conventional harmful factors there are effective individual and collective protective devices and their use shall mitigate the adverse effect on human health, which will be local and short term impact.

Concerning the health risk for the population in consequence of the KNPP Units 1 to 4 decommissioning it should be stated that the public health impact is almost 0, taking into account that the hazardous/radioactive materials, as well as the construction works, source of adverse conventional impact, will not cross the fence of the NPP site, thus in this case no special measures for mitigation of the impact on the public health in relation with the project implementation are needed.

The health status of the population in the Romanian territory from the 30-km area surrounding KNPP site does not differ from this of the Romanian population as a whole.

Subsequently and at the condition of observation of all planned measures, it can be summarized that the implementation of the Investment Proposal will not have an adverse effect on the environment state and will not have a contribution to the worsening of the occupational health at KNPP site and of the population in the 30-km radius surrounding area including Romanian territory.

8.14 Discomfort

The construction activities during the Pre-decommissioning (PD) stage and the decommissioning of KNPP Units 1-4, the construction sites and the slightly increased transport traffic will be sources of noise, dust and toxic gases. The emissions will be much lower than the limit values for noise and the hygiene standards for dust and toxic gases. The population will not be exposed to health risks, but it is possible to experience temporary discomfort. This will be valid mainly for the settlements through which trucks will pass. The discomfort will be negligible and temporary.

8.15 Social and socio-economic aspects

According to the adopted Continuous Dismantling Alternative for decommissioning of KNPP Units 1 to 4 during both of the stages of the decommissioning of the units, the personnel consisting of highly qualified and experienced professionals, who have operated the decommissioned reactors, will be redirected to employment in the new decommissioning activities of the units.

In this connection there is an agreement signed between Kozloduy NPP and SE “RAW” giving more detailed characteristic of the employment conditions recontracting and transfer of the personnel of KNPP– EP-1 to the new employer SE “RAW”. In practice this will achieve a number of positive results - preserving jobs and providing employment for the specialists made redundant because of the operational shutdown, conservation of their social acquisitions, use of the rich experience and knowledge of these specialists, achieving greater efficiency in the new activities, ensuring continuity and last but not least the negative crisis effects will affect to a smaller degree the unemployment level. The retention of the qualified staff in the new activities on the decommissioning may also have another positive effect - ensuring qualified personnel for the eventual construction and operation of the new unit of Kozloduy NPP.

With respect to the adopted Continuous Dismantling Alternative for carrying out the Decommissioning of Units 1 to 4 and the application of the proposed mitigation measures it can be summarized that the adverse social and socio-economic effect will be lower compared to the expected one as a result of the implementation of the other two assessed alternatives.

The decommissioning activities for KNPP Units 1-4 are not expected to impact the socio-economic aspects of the Romanian territory in the 30-km area surrounding KNPP site.

8.16 General conclusions

Based on the results from the EIAR and the experts' conclusions, in summary it can be stated that the assessed impacts on the environment and on people as a result of the Decommissioning of Units 1 to 4 of Kozloduy NPP during Pre-decommissioning phase, Stage 1, Stage 2 and Closure and land restoration Stage and as a result of the new preparatory projects implementations can be assessed as very low, taking into account that:

- The radiological impacts will be limited to significantly lower levels than those immediately after the KNPP Units 1 to 4 final shutdown and will be considerably reduced compared to the Units' operational phase. The radiological impacts can be reduced to even lower levels through consistent application of the ALARA principle, which is successfully applied to all previous activities performed on the Kozloduy NPP site.
- The non-radiological impacts of the decommissioning activities such as generation of conventional waste and harmful emission have been assessed as very low, local in terms of impact and short-term in terms of duration.

Most of the impacts are expected to be very low, but could be further reduced by applying the proposed measures to reduce, limit or prevent adverse impacts. In this connection cumulative impacts from decommissioning activities of the Units 1-4 KNPP, operation of Units 5 and 6, and National Disposal Facility are not expected.

Trans-boundary impact on the components and factors of the environment on the Romanian territory is not expected.

Based on the analysis and assessment of the Investment Proposal "Decommissioning of Units 1 to 4 Kozloduy Nuclear Power Plant" and on the ground of the performed studies, investigations and consultations as well as founded on the assessment of the environmental impacts and factors, the authors of this Environmental Impact Assessment Report propose to Supreme Environmental Expert Council at the Ministry of Environment and Water to prescribe the application of the relevant measures and recommendations stated in this Report and to APPROVE the implementation of the Investment Proposal of State Enterprise "Radioactive Waste".