

11.6 Attachments to Chapter 6

Attachment 11.6.1 Draft Environmental Management Plan
A. Mitigation Plan
B. Monitoring Plan

Attachment 11.6.2 Draft of an Environmental and Social Action Plan
(ESAP) for the Project P16

Attachment 11.6.1 Draft Environmental Management Plan

This attachment contains a DRAFT ENVIRONMENTAL MANAGEMENT PLAN with the respective sub-sections A. MITIGATION PLAN and B. MONITORING PLAN

DRAFT ENVIRONMENTAL MANAGEMENT PLAN

A. MITIGATION PLAN

Environmental Issue	Phase Predecom- missioning, Decom- missioning, Completion of decom- missioning	Mitigation Measure	Comments
Reduction, prevention or avoidance of the adverse effects (1) by radiation exposure of the personnel,	P, D	Efficient performance and in time updating of the programs and instructions based on the standards in force in relation to Radiological Protection. For example implementation of detailed dismantling instruction including a radition protection plan for dismantling work planned and executed in the contolled areas as described in the next measure.	For all “Environmental Issues” in the table, but especially for the complete Env. Issue (1) the following references have to be taken into account:
	P, D	On the basis of the measure above detailed instructions for each dismantling activity executed in the controlled areas have to be elaborated. These instructions have to be elaborated by the planning department before implementation of dismantling measures in the controlled areas. The radiation protection department is responsible to control during dismantling execution the compliance of the radiation protection measures in the respective dismantling instructions with the actual radiation situation on spot.	Regulation on Basic Norms of Radiation Protection (BG), (ONRZ 2012)
	D	Removal of all components/equipment of Category 3 as large as possible and later treatment after decay storage (KNPP Units 1 to 4 Updated Decommissioning Strategy)	Radiation Protection Regulation

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	P, D	Establishment, maintenance and regular update of Internal regulations and/or procedures for radiation control and for individual occupational dose control of the personnel and program for radiation control in the radiation protected area and the monitored area of the Units 1 to 4	(BG),2004)
	P, D	Pre-dismantling decontamination of systems and equipment (e.g. successful implementation of Projects 4A and 4B).	European ALARA Network (EAN) evaluation of the annual newsletters and workshop results
	P, D	Input of all necessary decommissioning data in time (e.g. amounts of material and contamination status) into the existing DeMans Database Systems and careful maintenance of the database system by the database administrator to have an actual overview about all radiation relevant materials and to plan further decommissioning actions very careful (as basis for measure 2).	(214) IAEA Safety Standard Series: Decommissioning of nuclear facilities, No. WS-R-5, Vienna, 2006.
	D	The Decommissioning Radiation Protection Concept has to be updated (at least every year) in line with the experience from decommissioning (e.g. evaluation of doses related to activities) and the results has to be the basis for updating of all actual (if necessary) and future to implement decommissioning instructions (input for measure 2). This measure is to implement in context with the first three measures above.	(219) IAEA-TECDOC-1394 Planning, management and organization of nuclear facilities decommissioning, Vienna, 2004
	P	Classification of the work places and of the radiological areas and strict control on the personnel access there.	(56) IAEA Safety Standard Series Decommissioning of Nuclear Power Plants and Research Reactors, Safety Guide, No. WS-G-2.1, IAEA, Vienna, 1999
	D	Performance of regular dosimetric controls of the overall decommissioning staff (including contractors) in compliance with with Regulation 32/7.11.2005.	
	P	Acceleration of the development of the project for Radiological inventory of buildings, systems and equipment of Units 1-4 of KNPP (Project 11C) to have an early sound basis for the measures as described above; especially for the first three measures and to have the	

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		basis for radiation protection measures (instructions – see measure 2) to plan and implement in time all necessary ALARA measures.	
	D	Under consideration of the measures above, all decommissioning activities to be carried out under strict preliminary control on the already realized dose exposure and under periodic control during all dismantling activities, in context with the mitigation measure 2. The evaluation should be done daily and the evaluations have to be summarised in the periodical technical reports, like Monthly Technical and Annual Technical Reports.	
	P, D, C	Regular monitoring in accordance with KNPP plan for monitoring in the 36 installed monitoring stations.	
	P, D	Observance of the best practices for all decommissioning activities, especially for all foreseen decommissioning activities in higher radiation levels, e.g. for the dismantling of the high activated reactor components. For example, implementation of mobile filter systems with HEPA filters for dismantling (cutting) activities foreseen on spot and on central treatment areas not located in the controlled areas as well. This measure is to consider especially for the elaboration of all dismantling instructions – see measure 2.	
(2) by radioactive releases to the atmosphere			
	D	Realization of the waste treatment activities such as thermal cutting and mechanical decontamination in closed rooms and/or in cabins with separate filtering systems (planned for the SRDW).	
	D	Use of mobile systems for capturing and filtering for all activities with potential of aerosols formation on all treatment areas not belonging to the controlled areas and maintain of all existing filter systems regarding the valid maintenance instructions.	
(3) of soils radioactive contamination			
	P	Realization of Project 23: inventory, treatment and conditioning of contaminated soil.	
	P	Incorporation of new sampling points for the purposes of soils radiation monitoring, related to the location of the decommissioning activities.	
	P	After specification of the location of the Decay Storage Site for Transitional RAW (DSS), of the needed area and construction technology, to identify the additionally required	

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		environmental protection measures in this sense a EHS risk assessment has to be elaborated before the DSS construction starts.	
	P	An updated plan (program) of the scope of the radiation monitoring of the sludge from drain channels dredging has to be implemented before the practical decommissioning can be commenced.	
(4) of the harmful impact by radioactive releases into surface and groundwater			
	P	Optimization of the liquid RAW management (Project 2).	
		Regular control and appropriate maintenance of the active drainage pipeline in order to prevent potential leakages and radioactive contamination.	
	P	Elaboration of instructions, procedures, methodologies and programs for implementation of process radiation control of the main sources of liquid radioactive discharge related to the dismantling and decontamination of the equipment this measure is a precondition for measure 2 – see above.	Consideration of references: (125) Radiation Monitoring Program, approved by the Minister of Environment and Water, Decree RD-227/06.04.2007 (150) Environment Radiation Monitoring Program during Kozloduy NPP Operation, Id. No UB.MP.PM.262/03, 2012
(5) of the harmful impact related to RAW management			
	P	Construction of Size Reduction and Decontamination Workshop (SRDW) (Project 12) in application of the relevant safety and environmental protection measures.	
	P	Construction of Decay Storage Site for Transitional RAW (DSS) (Project 19) in application of the relevant safety and environmental protection measures.	
	P	Construction of Facility for Treatment and Conditioning of Solid RAW with High Volume	

		Reduction Factor (RWT) (Project 5b) in application of the relevant safety and environmental protection measures.	
	P	Construction of Facility for Treatment of Low Level Liquid RAW (Danube system) in application of the relevant safety and environmental protection measures.	
	P	Construction of Facility for Retrieval and Stabilization of Spent Ion Exchange Resins (RES) (Project 5a) in application of the relevant safety and environmental protection measures.	
	P	Construction of Facility for Free Release Measurement (FRM) (Project 6a) in application of the relevant safety and environmental protection measures.	
	P	Supply of Equipment for Retrieval and Processing of the Liquid Phase from Evaporator Concentrate Tanks (LPR) in AB-1 (Project 9a) in application of the relevant safety and environmental protection measures.	
	P	Supply of Equipment for Retrieval and Processing of the Solidified Phase from Evaporator Concentrate Tanks (SPR) (Project 9b) in application of the relevant safety and environmental protection measures	
	P	Supply of different types of containers for transport and storage of materials resulting from dismantling works (WCP) (Project 11b) in application of the relevant safety and environmental protection measures.	
	P	Supply of mobile decontamination and treatment equipment (DTE) (Project 4a) in application of the appropriate safety and environmental protection measures.	
	P	Early introduction (implementation before the dismantling will start) of a „Residual Material Manual” as basis document for a smoothly running waste management procedure during the overall decommissioning process. For elaboration should be responsible the planning or waste management department and all procedures how to deal with the dismantled material to be fixed in that regulation have to be implemented by the dismantling department and supervised by the controlling or waste management department.	
(6) by non radioactive emissions to the atmosphere			
	D	In the above mentioned dismantling instructions, see measures in EMP (1), and also in the before mentioned “Residual Material Manual” have to be included all necessary packaging and transport means and the magement logistic how to use it, incl.transport routes and maintain these means for the decommissioning process (to dismantle, packing and transport	

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		the dismantled material). The dismantling planning department should be responsible for implementation in the mentioned documents and the dismantling department together with the controlling department should be in charge to supervise the correct implementation during the decommissioning activities. With regard to the intensive traffic on the site territory during the decommissioning to provide control for the use of transport vehicle in good shape.	
	D	Optimisation of the transports to avoid unnecessary emissions.	
	P	Supply of equipment for demolishing inside civil structures (EDS) (Project 26) under consideration of low dust, noise and vibration emission requirements.	
	P	Basis guideline for asbestos removal and necessary controlling and monitoring measures is given in the references as shown in the last column. The dismantling department has to be evaluate that all there described actions, measures and measurements are considered. Supply of asbestos removal equipment (ARE) (Project 25) under consideration of low fibres emissions requirements has to be finalized before dismantling of asbestos material can start.	(40) Regulation No5/15.04.2003 on Prevention and Reduction of Pollution of the Environment by Asbestos, (Promulgated SG 39/2003) (41) Regulation No9/4.08.2006 on Protection of Workers from Risk Related to Exposure to Asbestos at Work SG 71 /2006
(7) by soil pollution			
	P	Update and realization of the second stage of the Repository for conventional waste.	
	P	The existing radiation monitoring network to be used for determination of non radiation characteristics of soils as soils acidity, general heavy metal content during sampling analyses etc. This monitoring improvement enables to get information on an early stage for	

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		implementation of regarding measures to avoid soil contaminations.	
	P	From the areas, where sites for disposal of conventional and transient RAW will be constructed the fertile humus layer should be removed and stored separately for conservation according the provisions of Regulation N 26 of 2 October 1996.	
	P, D	Provide non radiation monitoring of the drain channels sludge dredging.	
(8) by non radioactive effluents into surface and ground water			
	P, D	With regard to the intensive traffic on the site territory during the decommissioning to provide control for the use of transport vehicle in good shape.	
	D	Water supply pipelines and fittings should be maintained in good operating condition in order to prevent leakages and losses.	
	D	With regard to the sensitivity of this region to pollution by nutrients continuous control of EP-1 sewage waters shall be followed for nutrient pollution. In the case of water pollution by nutrients, a biological water treatment facility has to be implemented to reduce the emissions of nutrients.	
	P	Establishment of in-house instruction aiming economy of potable and domestic water consumption.	
	D	The Hydrazine has to be removed from the conservation waste waters before draining into the surface water.	
(9) by conventional waste management			
	P	Supply of complex weight platform for transport vehicle station (Project 6e).	
	P	Update of the Conventional Waste Management Program by the planning department in consideration of the decommissioning activities in parallel to the decommissioning planning progress..	
	P	The Problem with the discarded chemicals should be solved stage by stage. That means, detailed procedures for the disposal of chemicals to be developed by the planning department in advance of the accumulation of the different chemicals.	
	D	An Integrated Environment, Health and Safety Management System for the decommissioning has to be developed and implemented under consideration also of all other environmental issues as described in the present EMP.	
	P	Elaboration of a manual for conventional waste management in line with the references as	(123)

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		can be seen in the last column.	Waste Management Act, promulgated in State Gazette 86 from 30.09.2003, last amended State Gazette 53 from 13.07.2012. (50) Experience from GREIFSWALD NPP decommissioning, Germany, EWN Environmental Impact Register, 2008
(10) of the harmful impact on the biodiversity (flora, fauna, protected territories and Protected Areas (Natura 2000))			
	P	After specification of the precise location of the Site for Conventional Waste from Decommissioning (SWD), the needed area, the manner of construction, to identify the additionally required environmental protection measures.	
	D	The existing monitoring program should be extended to use plant samples from the radiation monitoring also for determination of some conventional parameters such as heavy metals content in plants in the 3-km area. The existing monitoring program has to be adapted by the planning department in co-operation with the controlling department.	
	D	The monitoring of fauna species present onsite whose habitats would be potentially disturbed (or destroyed) by construction works is recommended. A plan must be developed to relocate habitats elsewhere.	
(11) of the negative socio-economic effects			
	P, D	Periodical update of the Program for the management of the social consequences from decommissioning of Units 1-4 of Kozloduy NPP, approved in 2006 by the KNPP.	
	P, D	Based on the Agreement between KNPP and State Enterprises RAW a part of EP 1 personnel to relocation (reemployment) by State Enterprises RAW. As basic document to solve that issue a redeployment plan should be prepared immediately by KNPP in closed co-operation	

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		with SE RAW. In preparation of such a redeployment plan it is proposed to organize meetings-interviews with each one of the staff of the suspended Units in order to clarify the options, preferences and opportunities for redirection, prequalification, additional training to acquire new knowledge and skills or preferences for early retirement..	
	P, D	KNPP Management should require the support of the Ministry of Economy, Energy and Tourism to provide funding allowing to preserve the highly qualified personnel, employed so far in the operation of the four shutdown Units. A personnel development plan should be prepared immediately in closed co-operation between SERAW and KNPP as basic paper for negotiations with the Ministry.	
	P, D	To provide mechanisms for re-qualification of the former personnel of the shutdown Units aiming their integration in the decommissioning process. That should be included in the redeployment program as described two measures before.	
(12) Measures for minimization of fire risks and fire consequences			
	P, D	In order to mitigate the adverse impact and risk of fire for the environment and the population during the decommissioning of the Units, the requirements of the respective decommissioning procedures shall be observed, aiming to avoid occurrence of fire and to observe the fire protection rules.	
	P, D	In the framework of the elaboration of Decommissioning Safety Analysis Report to assess the fire risk and to propose appropriate measures for fire occurrence prevention and limitation of fire consequences.	
(13) Emergency planning with regard to the modifications related to risk of accidents in decommissioning conditions			
	P,D	Strictly observe the requirements and instructions stated in the approved Updated Emergency Plan of Kozloduy NPP [132], including activities during decommissioning of Units 1-4.	

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B. – MONITORING PLAN

Phase Construction Operation Decommissioning	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?/ type of monitoring equipment	When is the parameter to be monitored? (frequency of measurement or continuous)	Why is the parameter to be monitored? (optional)	Responsibility	
						Organisational KNPP Structure (Department)	Person (name)
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To supervise the effectiveness of the mitigation measures as described in the “EMP - A. Mitigation Plan” in avoiding or minimizing the harmful impacts, it will be necessary to define respective measurement points and the frequency and methodology used for such measurements.

The already existing KNPP monitoring plan could be used as basis and should be periodical updated regarding consideration of all requirements coming from the decommissioning progress.

The mentioned measurement features “What, Where, How, Why” have to be defined by the KNPP Environmental Manager as appointed regarding the ESAP. The responsible organizational entity and the respective person for the parameters to be monitored have to be nominated and fixed by the Environmental Manager.

***Attachment 11.6.2 Draft of an Environmental and Social Action Plan (ESAP)
for the Project P 16***

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No	Action	Environmental Risks Liability/ Benefits	Legislative Requirement/ Best practice	Investment Needs/ Resources/Costs	Timetable Action to be Completed by End of Year	Target and Evaluation Criteria for Successful Implementation	Comment
1.	Environmental protection and health management						
1.1	Appointment of a qualified Environmental Manager	Improved corporate environmental performance and reporting, reducing risk and improving compliance	Best practice	Internal resources	End of 2012	EIAR elaboration on a high quality level; Implementation of the EMP	
1.2	Environmental Impact Assessment (EIA) for the decommissioning of the KNPP Units 1 to 4 is a process of identifying, predicting and evaluating the environmental, social and other relevant effects and physical activities and mitigating the adverse risks and consequences, taking into consideration public opinion, prior to a decision being made.	Poor implementation of EIA requirements or lack of these can result in objections and possible annulment of planning or building permits and to high emission values.	Best practice, EU EIA Directive and EBRD Environmental Policy.	Consultants/ Internal resources of KNPP.	Ongoing.	EIA undertaken in accordance to National and EU requirements for PMF.	

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No	Action	Environmental Risks Liability/ Benefits	Legislative Requirement/ Best practice	Investment Needs/ Resources/Costs	Timetable Action to be Completed by End of Year	Target and Evaluation Criteria for Successful Implementation	Comment
1.3	An environmental, health and safety compliance audit to be undertaken by independent environmental consultants to assess liabilities. Implementation of the recommendations stemming from the compliance audit to bring all activities in compliance with national and EU standards for environment, health and safety	Improved awareness of compliance status and areas to be address. Improved compliance.	Best practice, but also required under the EBRD Environmental Policy.	Internal resources of KNPP/consultants.	12 months after decommissioning operation starts	Provide summary of audit report and recommended actions to EBRD; Timetable to implement recommended actions to be agreed with EBRD.	
1.4	Implementation of an Environmental Management System (EMS)	Optimisation of environmental management through a formalised system. Provide resources for training of the personnel and monitoring of emissions.	Best practice, but also required under the EBRD Environmental Policy.	Internal resources of KNPP and external consultants. Costs must be planned in advance	12 months after decommissioning operation starts.	Development of an EMS regarding ISO 14001 or equivalent. Annual EHS Report to the Bank	

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No	Action	Environmental Risks Liability/ Benefits	Legislative Requirement/ Best practice	Investment Needs/ Resources/Costs	Timetable Action to be Completed by End of Year	Target and Evaluation Criteria for Successful Implementation	Comment
1.5	Implement an Occupational Health and Safety Management System.	Improved health and safety performance, risk reduction, enhanced stakeholder reputation.	Best practice, but also required under the EBRD Environmental Policy	Internal resources of KNPP	12 months after decommissioning operation starts	Certification	
2.	Personnel management and training						
2.1	Appointment of decommissioning personnel	Evaluation and improvement of all personnel necessary measures	Best practice	Internal resources of KNPP	12 months before decommissioning operation starts	Early staff availability for further decommissioning operation improvement	
2.2	Appointment of an Environmental Managing organisation under the leadership of the Environmental Manager (required in 1.1)	Early implementation of all environmental protection measures and of all plans to avoid and minimise eventual negative environmental impacts	Best practise and EBRD Environmental Policy	Internal resources of KNPP	12 months before decommissioning operation starts	Early consideration of all environmental requirements in all already evaluated environmental plans	

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No	Action	Environmental Risks Liability/ Benefits	Legislative Requirement/ Best practice	Investment Needs/ Resources/Costs	Timetable Action to be Completed by End of Year	Target and Evaluation Criteria for Successful Implementation	Comment
2.3	Early start of training for the decommissioning personnel	Not well trained personnel can result in a not optimal decommissioning operation and lead to negative impacts on the environment	Best practice	Internal resources of KNPP	Start 12 months before decommissioning start and then in continuation	Minimisation of the emission values and avoidance of risks	