#### **NOTIFICATION**

## TO AN AFFECTED PARTY OF A PROPOSED ACTIVITY UNDER ARTICLE 3 OF THE CONVENTION ON ENVIRONMENTAL IMPACT ASSESSMENT IN A TRANSBOUNDARY CONTEXT

#### **ABOUT**

### DECOMMISSIONING OF UNITS 1 TO 4 AT KOZLODUY NPP

1. INFORMATION ON THE PROPOSED ACTIVITY			
(i) Information on the nature of the proposed activity			
Type of activity proposed	The decommissioning activities consist of all administrative and technical actions taken to decrease the radioactive contamination on the site to a degree that allows the release of the nuclear facility from regulatory control under the Safe Use of Nuclear Energy Act.		
Is the proposed activity listed in Appendix I to the Convention?	No. (However some of the activities - treatment, conditioning, storage and disposal of radioactive waste, are included in the referred appendix.)		
	The decommissioning of Units 1 to 4 of KNPP includes 2 stages:		
Scope of proposed activity (e.g. main activity and any/all peripheral activities requiring assessment)	Stage 1 (2011-2018): Preparation and Operation of Safe Enclosure (SE) of Reactor Building and dismantling of the equipment that is outside the Safe Enclosure Area;		
	Stage 2 (2018-2035): Deferred dismantling of the equipment within the Safe Enclosure and clearance of the buildings for use for other purposes.		
	Both stages include processes of decontamination and dismantling, which involves handling, pre-treatment, treatment, conditioning, storage and disposal of radioactive waste.		
	Dismantling of equipment (in non-contaminated buildings and in the turbine hall of Units 1 & 2) will start from outside the SE - immediately after the required regulatory authorisation has been obtained. The same activities should start, one year later, in the Turbine Hall of Units 3 & 4 (when the Decommissioning Permit for these units is expected to be obtained).		
	Proper infrastructure for dismantling, fragmentation, sorting, volume reduction, decontamination, and free-release measurements will be installed in advance for the purposes of the decommissioning.		
Scale of proposed activity (e.g. size, production capacity, etc.)	The progress of the dismantling activities will be adjusted in a way to ensure enough available capacity exists for decontamination, treatment and disposal or free release of the resulting materials streams.		

#### **Non-radioactive waste**

#### Solid waste

After the free release and decontamination, considerable solid non-radioactive waste (conventional waste, household, constructional waste, commercial waste, industrial waste, inflammable waste from combustible materials, etc) is expected to be generated from dismantling of process equipment and demolition of auxiliary concrete structures. This waste shall be forwarded for recycling and reuse in industry and construction.

#### Liquid waste

Industrial, sewerage, hazardous, purified, drained, rain or other waters generated during the processes of construction, operations, decommissioning or possible accidents;

#### Waste gases

Non-radioactive emissions from operational processes, non-organized emissions, transport emissions, dust from material processing and equipment, smells, etc.

#### Hazardous physical non-radioactive releases

Sources of noise, heat, light or electromagnetic fields that have been envisaged by the decommissioning projects.

#### **Radioactive waste**

#### Solid waste

Solid radioactive waste is expected to be generated from the preparation and operation of Safe Enclosure, dismantling of process equipment and demolition of auxiliary concrete structures. That waste is to be treated by the existing facilities for processing and disposal at the SE "RAW".

#### Liquid waste

Liquid RAW is expected to be generated from the preparation and operation of the SE as well as from decontamination of dismantled contaminated equipment.

#### Gaseous waste

Gaseous waste is expected to be generated during Decommissioning Stages 1 and 2 - these are to be trapped and purified by Units 1-4 ventilation systems.

The sources of the respective materials and wastes, the method for their management with further storage or release of control and their quantitative assessment shall be described in the Environmental Impact Assessment Report on the bases of the provided data base available in KNPP under form of plans, reports and analyses.

# Description of proposed activity (e.g. technology used)

The Decommissioning activities mainly include dismantling, decontamination of activated materials, free release of non-contaminated materials, size reduction and treatment for safe storage of RAW.

#### **Methods for Dismantling of Equipment**

The dismantling techniques may generally be grouped into three categories – mechanical, thermal and others.

The following methods for dismantling may be applied:

#### • Thermal cutting is sub-divided into:

- Oxygen cutting may use liquid fuel or gas;
- Electric arc cutting;
- o Plasma arch cutting.

#### Mechanical cutting

Various dismantling techniques are planned to be used:

- High force shears cutting no resulting waste materials are formed with this method (shavings, dust, etc.); various suitable cutting surfaces, (usually hydraulically driven) are used; these tools are widely used.
- Cutting by the use of disk and sawed tools various types of sawed tools (discs or tapes) and different depths of cutting are achieved depending on the specific techniques, resulting quantity of waste is generated and respective wear of the instrument.
- Cutting by jackhammers, nut runners and wrenches for fragmentation and unbolting, for disconnecting of screws and nuts;
- Cutting by pressure jet –because of it capability to operate within a
  wide range of applicable loads (cavitation, electric or ultrasonic
  modulation, jet cutting, etc.). Depending on the used operating fluid,
  cutting is performed with pure water or water mixed with abrasives.
- Cutting concrete by diamond wire.

#### Methods to Remove Concrete

Special equipment shall be needed to remove concrete bases or other auxiliary concrete structures.

The equipment shall mechanically destroy or decrease concrete to parts of suitable size to be transported and further disposed.

#### **Methods for Decontamination of Equipment**

During decommissioning, the decontamination shall be used to reduce surface contamination of equipment and respective occupational dose burden during the dismantling activities. Other reasons for decontamination may be to reuse or recycle the materials as well as to meet the criteria for their final disposal. Depending on the site that is subject to decontamination, the planned decisions

#### Decontamination of loops/systems

and methods are as follows:

The option for the implementation of Hard Decontamination has been chosen currently and it is to apply the regenerative cerium process. Decontamination shall cover the six primary loops and the pressuriser as well as of Water Treatment System 1 using a mobile decontamination facility.

#### Decontamination of tanks and pools

Mobile equipment is supplied for the purpose of decontamination of surfaces of reactor refuelling pool (RRP), spent fuel pools and their racks and other tanks of that size, reprocessing of their water contents and conditioning of the resulting RAW.

#### Decontamination of dismantled equipment

The following is discussed for decontamination of KNPP Units 1-4 equipment throughout the decontamination process:

- Decontamination with water jet;
- o Abrasive decontamination;
- o Chemical decontamination with phosphorous acid;
- Chemical decontamination:
- Electrochemical decontamination with oxalic acid;
- Ultrasonic decontamination.

## Description of purpose of proposed activity

Decommissioning includes all administrative and technical measures that are taken to remove all ionizing radiation sources from the nuclear facility site which are subject to regulatory control according to the Safe Use of Nuclear Energy Act. These measures include decontamination and dismantling.

	Decommissioning shall be performed in such a way as to ensure radiation protection and safety of staff and population as well as protection of the future generations from the harmful impact of ionizing radiation.		
	Solid low active waste will be treated in a Plasma Melting Facility with a high volume reduction factor for which will be developed a specific EIA Report. The treated wastes will be included in a cement matrix and provided for safe storage to the SE RAW.		
Rationale for proposed activity (e.g. socio-economic, physical geographic	There is no technical or practical need of Units 1 – 4 decommissioning. The Units 1 – 4 were shut-down by the virtue of the political decision of Bulgaria to join the EU. Units 1 and 2 were disconnected from the grid at the end of December 2002, and Units 3 and 4 - at the end of December, 2006 respectively.		
	The rational for the selection of the "Continuous Dismantling" Strategy is that the following will be achieved:		
	<ul> <li>Minimization of the Safe Enclosure scope;</li> <li>Minimization of decommissioning period;</li> <li>Even distribution of dismantling activities for the entire period after final shutdown of the units;</li> </ul>		
basis)	Smooth and effective utilization of financial resources;      Smooth and effective utilization of hymnon resources;		
	<ul> <li>Smooth and effective utilization of human resources;</li> <li>Even loading of the existing infrastructure for waste processing;</li> </ul>		
	<ul> <li>Maximum retention of jobs during the decommissioning period. Keeping of hundreds of jobs are to be preserved during decommissioning for decades;</li> <li>Optimum utilization of the existing knowledge about the nuclear power</li> </ul>		
	plant.		
	The selection of decontamination technologies is carried out on the basis of proven by practice technologies through analyses and evaluations of their efficiency, based on:		
	<ul> <li>Current state of radioactive contamination of facilities or structures and Justification for reaching the planned levels and indicators after the decontamination;</li> <li>Analyses and determination of the types and quantities of RAW generated</li> </ul>		
	as a result of decontamination and possibilities for their treatment,		
Additional information/comments	<ul> <li>keeping and storage;</li> <li>Assessments for the expected exposure doses of the personnel and measures for non-exceeding of the determined basic exposure limits;</li> <li>Eventual harmful effects of the selected technology in order to decrease them to the possible minimum;</li> </ul>		
	Methods, technologies and the sequence of dismantling of structures, systems and components of the facilities are determined, taking into account the:  Achieved results during dismantling in the previous stages of decommissioning and the accumulated experience during dismantling;  Progress of the methods and technologies for dismantling and their applicability to the envisaged dismantling activities;		
(ii) Information on the	spatial and temporal boundaries of the proposed activity		
Location+	The site of the KNPP, where the decommissioning activities of Units 1 to 4 are planned, is situated in the north-west part of the Republic of Bulgaria, on the South bank of the Danube River, at 3.5 km to the South-East of the town of Kozloduy.		

#### The site is located at the 694th kilometre along the Danube River and is located at 3.7 km to the South of the river bed and on the state boundary with the Republic of Romania. The region of the site is located in the northern part of The Kozloduv site is situated on a plain, with an average altitude varying from +28.00 m to +36.00 m according to the Baltic altitude system. The lowland and the site are protected from the Danube River by means of a dyke Description of the which reaches an absolute elevation of +30.40 m. location (e.g. physical-geographic, Within 30km around the KNPP site the following settlements are located: socio-economic - Bulgarian administrative centres of the municipalities: Kozloduy, characteristics) Vulchedrum, Hajredin, Mizia, Lom, Biala Slatina, Oriahovo. - About 23 comunities on the territory of Romania - (Bechet, Nedeia, Gighera, Zäval, Ostroveni, Sărata, Călăraşi, Dăbuleni, Lişteava, Piscu Sadovei, Sadova, Gângiova, Mâcedu de Jos, Măcedu de Sus, Săpata, Plosca, Bistret, Brånduşa, Goicea, Bârca, Horezu Poenari, Toceni, Valea Stanciului Rationale for location of proposed activity The location of the decommissioning activities will be restricted in the site of (e.g. socio-economic, KNPP Units 1 to 4. physical-geographic basis) The Decommissioning Permit for Units 1&2 is planned to come into force on 01/01/2012, respectively the dismantling activities could start in 2012. Stage 1 includes the phases of Preparation for Safe Enclosure and Operation of Safe Enclosure, as well as dismantling of equipment that is outside the Safe Enclosure Area. The preparation for Safe Enclosure of Units 1 & 2 will start on 1 January 2012 on commencement of the Decommissioning Permit. The dismantling of equipment outside the Safe Enclosure Area is planned to start in parallel with Time-frame for this and with the dismantling of equipment from the non-contaminated proposed activity (e.g. buildings and the Turbine Hall of units 1 and 2, start and duration of The end of Stage 1 will be marked by the completion of the dismantling construction and outside the Safe Enclosure Area. The Stage 1 duration as per the provisional operation) Schedule is seven years. Dismantling of equipment in the Safe Enclosure Area will be done during Stage 2. The end of Stage 2 will be marked by the completion of the dismantling and of the activities related to the clearance of the building by the Regulator. The Decommissioning Permit for Units 3&4 is planned to come in force on 01/01/2013 hence the dismantling activities on these units could start in 2013, respectively all relevant subsequent activities will be shifted with 1 year. Maps and other pictorial documents Attachment 1 of this document presents the maps showing units 1 to 4 site connected with the location and its position to the Romanian/Bulgarian border. information on the proposed activity

Additional	
information/c	omments

#### (iii) Information on expected environmental impacts and proposed mitigation measures

An Environment Impact Assessment Report of investment proposal for implementation of decommissioning of Units 1 to 4 shall be performed according to:

- The Bulgarian legislation in force (Environmental Protection Act, Regulation for the terms and the conditions for the EIA) by an Independent Team of skilled Environmental Experts.

Scope of assessment (e.g. consideration of: cumulative impacts, evaluation of alternatives, sustainable development issues, impact of peripheral activities, etc.)

The EIA-R will fulfil:

- The Guidelines of Bulgarian Ministry of Environment and Waters.
- The EBRD Policies and the EC Directive (Directive EC 85/337/EEC, amended by 97/11/EC-EC EIA Directives, which are adopted into the Bulgarian legislation).

The EIA-R will describe, analyze and assess the potential effects and the possible significant impacts to the people and environment, including cumulative impacts, evaluation of alternatives, sustainable development issues, impact of peripheral activities, etc. The EIA will analyze the impacts on the people and environment during stages 1 and 2 of the decommissioning.

A consideration of site emergencies and accidents will also be provided.

The Environmental Impact Assessment Report will analyze all possible environmental impacts of proposed activity, summarized in the table below.

Expected environmental impacts of proposed activity (e.g. types, locations, magnitudes)

Impact	Type of the impact							
on	direct	indirect	secondary	cumulative	short / medium / long term	permanent / temporary	positive	negative
Humans	Possible	Possible	Possible	Possible	LT	P/T	Work places	-
Climate and landscape	Possible (landscape)	Not expected	Not expected	Possible	M landscape)	T landscape	Not expected	Not expected
Air	Possible	Possible	Possible	Possible	LT	Т	Not expected	Not expected
Water	Possible	Possible	Possible	Possible	LT	Т	Not expected	- Not expected
Ground and soils	Not expected	Not expected	Not expected	Not expected	LT	Т	Not expected	Not expected -
Protected territories, regional flora and fauna	Not expected	Possible	Not expected	Not expected	М	Т	Not expected	Not expected
Noise/ Vibration	Possible, but not expected	Not expected	Not expected	Possible	ST	Т	No	No-

Expected environmental impacts of the construction and operation of supporting facilities (Decontamination and Size Reduction Facility and Plasma Melting Facility) should be in the frames and limits defined by national and international requirements for civil construction and nuclear facilities construction and operation. All these requirements will be specified and analyzed in the EIA report (for the Plasma Melting Facility a separate EIA process is in progress) and will be controlled in accordance with established regulatory procedures. It is expected that associated non-radiological environment impacts during Stage 1 will be low and have no transboundary effects. The expected radiological effects during Stage 2 will be negligible.

### Inputs (e.g. raw material, power sources, etc.)

Potential inputs of raw material, power sources, etc. e.g. consumption of fuel, raw materials and materials are expected to be adequate for this type of construction work required and for operation of the supporting facilities (cement will be required for cementation of the treated RAW).

#### Expected potential impacts in non-radiation aspect:

#### 1. On the atmosphere:

Possible during the construction and operation of the supporting facilities (noise, vibration, dust – waste gases from transportation vehicles) – Facility for Decontamination and Size Reduction and Plasma Melting Facility (for which a separate EIA process is envisaged).

#### 2. On the water:

During the operation of Facility for Decontamination and Size Reduction and Plasma Melting Facility (generation of waste water from the collected rain water from the supporting facilities surface and from the conventional sewage water system).

#### 3. On the soils:

Not expected

#### 4. Generation of solid waste

During the construction of the supporting facilities (generation of solid constructional waste); during the dismantling activities construction wastes from foundations of machines will be obtained and decontaminated materials subject to free release as well as non-contaminated materials (from Turbine Hall for example).

Expected potential impacts in radiation aspect:

#### 1. On the atmosphere:

It is expected it will not exceed the established dose limits for the working conditions as well as those of the regulatory requirements. In the event of possible emergencies and accidents it would be temporary, short-term and reversible.

#### 2. On the water:

During the operation of Plasma Melting Facility and Facility for Decontamination and Size Reduction, the waters will be cleaned and reused in order to minimize the quantities of contaminated water.

#### 3. On the soils:

Not expected. Only in cases of accidents, very low probability.

Outputs (e.g. amounts and types of: emissions into the atmosphere, discharges into the water system, solid waste)

	Generation of solid waste:     During the dismantling activities radioactive materials subject to further treatment will be obtained (decontamination, size reduction, categorization, treatment).			
Transboundary impacts (e.g. types, locations, magnitudes)	In case of no accidents or any abnormal events it is expected that no transboundary effects will occur.			
Proposed mitigation measures (e.g. if known, mitigation measures to prevent, eliminate, minimize, compensate for environmental effects)	The planned activities include technical and administrative measures to maintain the risk of operation in accordance with Bulgarian Nuclear Regulatory Agency requirements and the nationally and internationally accepted radiological dose limits and constrains (IAEA Basis Safety Standards, EU Directive 96/29/Euratom of 13.05.1996 "Laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation", Bulgarian Regulation on Basic Norms of Radiation Protection, Bulgarian Regulation on Safe Management of Radioactive Waste)			
	In addition, a number of administrative measures will ensure the safe application of all supporting activities (operational procedures and instructions; radiation protection; emergency plan and procedures; radiological and non-radiological surveillance and monitoring programs; special protective zones; safety case and periodic safety review; regulatory inspections; peer reviews, etc.).			
	The operation of the supporting facilities will be in compliance with the established norms and limits and will prevent, minimize or avoid any significant negative impacts on the environment, population and personnel.			
	The recommended measures from EIA-R will be implemented in the design of the facilities involved in the process and the above described procedures, including environmental management system, monitoring programs, emergency planning and preparedness.			
	Special attention will be given on the compliance with the waste acceptance criteria for storage and disposal. Emphasis will be given on the characterization of the waste, tracking and record keeping.			
Additional information/comments	The Bulgarian Nuclear Regulatory Agency performs a strict control over the activities on the site, which is demonstrated by means of issuing permits and corresponding approvals for each of the phases and for each of the supporting facilities, as well as control over the implementation through regular inspections.			
	This BNRA control ensures that all the requirements for safety and protection of the personnel, the population and the environment will be followed.			
	All these activities are also controlled by international institutions, including IAEA.			
(iv) Proponent/developer				
(,	Kozloduy NPP, Plc			
Name, address,	Bulgaria, 3321 Kozloduy,			
telephone and fax	Phone: +359 973 7 2020,			
numbers	Fax: +359 973 8 05 91			

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(v) EIA documentation	
Is the EIA documentation (e.g. EIA report or EIS) included in the notification?	No
If no/partial, description of additional documentation to be forwarded and (approximate) date(s) when documentation will be available	Additional information will be sent on request after receiving responses to the present notification and upon positive answer on behalf of the Romanian country and declaration of who will participate in the procedure.
Additional information/ comments	No
2. POINTS OF CONTAC	
• • • • • • • • • • • • • • • • • • • •	r the possible affected Party or Parties
Authority responsible for coordinating activities relating to the EIA (refer to decision I/3, appendix)  - Name, address, telephone and fax numbers	Ms. Dorina MOCANU Director Directorate for Pollution Control and Impact Assessment Ministry of Environment and Forests 12, Blvd. Libertatii, Sector 5, Bucharest RO - 040129 Telephone: +40 21 316.77.35 Fax: +40 21 316.04.21 E-mail: dorina.mocanu @mmediu.ro
List of affected Parties to which notification is being sent	No
(ii) Points of contact fo	or the Party of origin
Authority responsible for coordinating activities relating to the EIA (refer to decision I/3, appendix) - Name, address, telephone and fax numbers	Ministry of Environment and Water 22 Maria Louisa Blvd. 1000 Sofia Telephone: +359 2 988 25 77 Fax: +359 2 986 25 33  Ms. Jacquelina METODIEVA Head of EIA/EAD Department Telephone: +359 2 940 60 32 E-mail: metodieva @moew.government.bg
Decision-making authority if different than authority responsible for coordinating activities relating to the EIA - Name, address, telephone and fax numbers	

3. INFORMATION ON THE EIA PROCESS IN THE COUNTRY WHERE THE PROPOSED ACTIVITY IS LOCATED		
(i) Information on the EIA process that will be applied to the proposed activity		
Time schedule	Based on the requirements of the Bulgarian legislation	
Opportunities for the affected Party or Parties to be involved in the EIA process	Yes	
Opportunities for the affected Party or Parties to review and comment on the notification and the EIA documentation	Yes	
Nature and timing of the possible decision	3 months after the last meeting for Public disclosure.	
Process for approval of the proposed activity	In accordance to the Environmental Protection Act (SG No.91/2002) and Regulation for the terms and conditions for the EIA (SG No.25/2003). Last revision available on Internet page: <a href="https://www.moew.government.bg">www.moew.government.bg</a>	
Additional information/comments	None	
4. INFORMATION ON	THE PUBLIC PARTICIPATION PROCESS IN THE COUNTRY OF ORIGIN	
Public participation procedures	In accordance with Bulgarian legislation:  - The public/all physical and legal entities shall be notified about the place and date of the Public discussion (PD) not later than 30 days before the PD meeting.  - Access to the EIA documentation shall be ensured for a period of 30 days prior to commencement of the Public Disclosure.  - The public/all physical and legal entities shall submit their comments and statements in writing at the Public Disclosure meeting and propose those for discussion during.	
Expected start and duration of public consultation	The Public Consultation Process will start when the EIA Report is elaborated. The expected start for Public Consultation Process is foreseen for the second half of 2010. However it will depend on the progress of the consultations on the scope of the EIA Report which are not closed currently. The duration will follow legal requirements.  In case of a declared agreement on behalf of Republic Romania participation in the EIA Procedure, then the Romanian side will be informed following the legal rules.	
Additional information/comments		
5. DEADLINE FOR RESPONSE		
Date	2 weeks from the date of receiving the notification	

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## TO AN AFFECTED PARTY OF A PROPOSED ACTIVITY UNDER ARTICLE 3 OF THE CONVENTION ON ENVIRONMENTAL IMPACT ASSESSMENT IN A TRANSBOUNDARY CONTEXT

#### **ABOUT**

### DECOMMISSIONING OF UNITS 1 TO 4 AT KOZLODUY NPP

Attachment 1

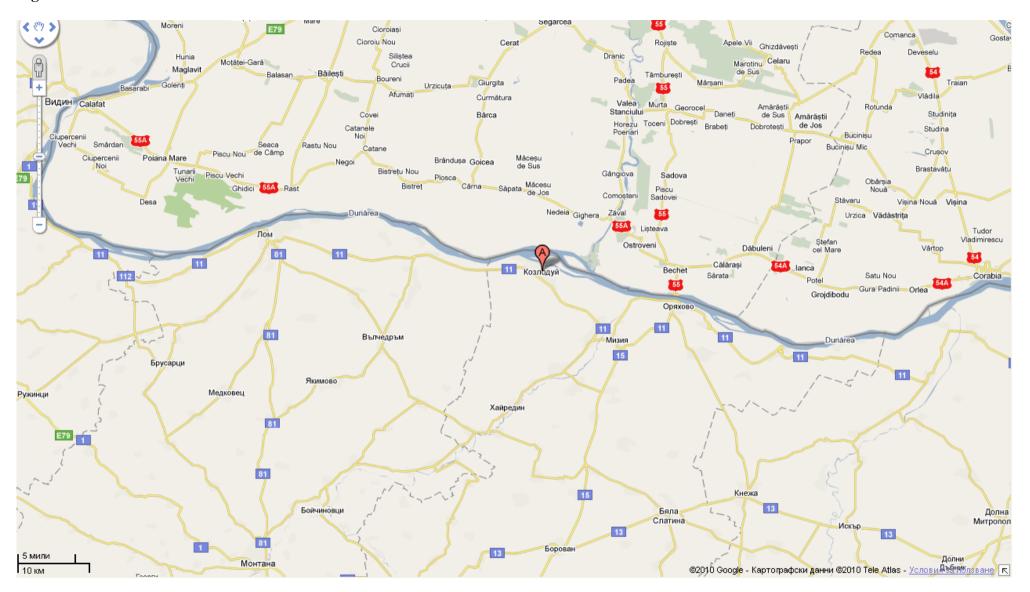
**MAPS** 

#### I. Location map of units 1 to 4 of Kozloduy NPP

Figure I-1



Figure I-2



### II. Kozloduy NPP Radiation protection and Monitored areas Figure II-1

