

S t a t e C o a t o f A r m s
R E P U B L I C O F B U L G A R I A
M I N I S T R Y O F E N V I R O N M E N T A N D W A T E R

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D E C I S I O N
O N E N V I R O N M E N T A L I M P A C T A S S E S S M E N T
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Pursuant to Article 99 para 2 of the Environmental Protection Act, Article 19, para 1 of the *Ordinance on the conditions and order for performance of environmental impact assessment* (“EIA Ordinance”) and in conjunction with Article 31 of the *Biological Diversity Act* and Article 39, para 12 and 13 of the *Ordinance on the conditions and order for performance of assessment of the compatibility of plans, programmes, projects and investment proposals with the subject and objectives for preservation of protected territories* (“CA Ordinance”),

I H E R E B Y A P P R O V E

The implementation of investment proposal for “Facility for Treatment and. Conditioning of Radioactive Waste with a High Volume Reduction Factor at Kozloduy Nuclear Power Plant Facility (HVRF)”

Contracting authority: Kozloduy NPP EAD

Seat: town of Kozloduy, 3321

Short description of the investment proposal:

The investment proposal envisages the construction of Facility for Treatment and. Conditioning of Radioactive Waste with a High Volume Reduction Factor at Kozloduy NPP though the use of plasma technology, whereby a reduction in the volume will be achieved in respect of low and intermediate level radioactive waste (RAW) stored in the temporary storage repositories located on the site of Kozloduy NPP and their subsequent

safe disposal. The selected technology is high-energy, capable of treating radioactive waste by creating thermal plasma field through directing electric current through a low-pressure gas stream.

The following groups of low and intermediate-level RAW will be treated and conditioned at the plasma melting facility (PMF):

- RAW generated during the operation of Units 1 to 6 of Kozloduy NPP and currently stored at the site of KNPP;
- Additional quantities of RAW the generation of which is expected during the dismantling activities in the process of decommissioning Units 1 to 4 of Kozloduy NPP;
- Wastes expected to be generated in the course of the continuing operation of Units 5 and 6, as well as their preparation for future decommissioning.

The investment proposal will be implemented on the territory of Kozloduy NPP, which is located at 120 km straight-line distance, and at 200 km road distance from the city of Sofia. The site of the power plant is situated at the 694th kilometre of the Danube River. It is at 3.7 km to the south of the water course of the river and the state border with Romania. It is located in the northern part of the first non-floodable (loess) terrace of the Danube River. The area of the entire site is about 3.2 km, and along with the channels for circulation and service water supply it reaches 5.2 km. The proposed PMF will be installed on the site of Kozloduy NPP, within special building - 2 (AB-2), in room BK301 at elevation +6.30m and Room BK039/3 at elevation +0.00m. The room is connected to the systems of the site providing supply of electricity, steam, compressed air; demineralized water, coolant water, nitrogen and ventilation.

AB-2 is a building constructed in order to service Units 3 and 4 of Kozloduy NPP and Room BK301, in which PMF will be located, is not currently used. The room is approximately 71.3m., 36.4m wide and with a total height of approximately 8.45 m, and its indoor space is serviced by three cranes of lifting capacities of 6.3t, 4.0t and 2.0t.

Partial building reconstruction is planned for Room BK301.

The height of the part that will be reconstructed includes:

- lifting the middle part of the roof structure of room BK301 (between lines B and C) in the section from axis 14 to axis 19 and restricting the crane rail of the existing 2-ton crane servicing this section to axis 14;
- Installation of a new one-beam overhead crane (with lifting capacity of 5t) for servicing

PMF, the crane rail of which covers the area under the elevated part of the roof structure of room BK301;

- Reconstruction of the ventilation air ducts of the existing intake-extraction ventilation system of room BK301;
- Implementation of additional firefighting engineering and technical measures.

The access to the room is from the side of the controlled access zone to the east, or by the staircase from the western side. A lock (3.00m x 5.00m) is located on the floor at the northeastern corner of the room under which at elevation 0.00m there is a loading and unloading segment with an option for receiving vehicles transporting equipment or waste. The access to the unloading segment is through a pair of gateways in each of the segment's ends, as the gateways are 4.00m wide and 4.50m high.

In the southeastern segment of room BK301, serviced by the 6.3-ton crane, a zone is planned for temporary storage of incoming RAW, secondary wastes and barrels with treated wastes in the form of vitrified mass.

The individualization of three zones is planned, determined for storage of a total of 6,000 kg of incoming RAW, which is the approximate quantity necessary for one-week operation of PMF, as well as another zone for 6 barrels of treated waste which represents the expected productivity for one week operation. Given the maximum weight of each type of package for waste, the temporary warehouse can store 100 bags (20 kg/bag), 20 barrels (100 kg/barrel) or 8 pellets (250 kg/pellet). The temporary warehouse is an enclosed zone, equipped with two labyrinth entrances, as the packages of waste will be accessible with the aid of the crane and mobile fork lifter.

The transport of RAW to and from PMF will be adjusted to the existing transport scheme for treated and untreated RAW at the site of Kozloduy NPP.

The process of RAW treatment and conditioning includes the following technological scheme:

Untreated waste, also including compacted waste in 200l barrels and super-compacted waste, arriving at AB-2 in waste containers of Kozloduy NPP through the existing lock in the building of AB-2. The packaged waste is unloaded from the container with the aid of a grab device suspended on the crane hooks of the existing crane in AB-2 and are placed in the temporary warehouse. The untreated waste will be transported to the PMF's conveyer system through the specified grab device, after which the conveyer system will feed the

untreated waste into the shredder unit. This system consists of semi-automatic conveyer (with built-in balance), lifting device, airlock, and two-stage shredder units with extrusion tube.

The shredder and the extrusion tube process untreated waste to tiny and comparatively homogenous material. The primary treatment chamber (PTC) is continuously fed with this material of fragmented waste. The shredder block is ventilated with N₂ in order to reduce the concentration of oxygen below 4%.

PTC is a high-temperature (1100°C — 1500°C) tilting furnace. The furnace volume is designed in such a manner as to receive about 200l of slag. The exterior diameter of the primary treatment chamber is approx. 2.2m, and its height is about 2.8m. PTC is designed for treatment of about 80kg/h, rate of 65kg/h, shredded organic waste for 100 hours a week, starting from Monday morning to Saturday morning, inclusive. The volume of the daily produced slag is 170 litres, which is cast in 190-litre mould.

Two types of burners are planned. The first is a diesel burner with capacity of 300kW, which is used for drying or heating of the cold furnace, as well as for maintaining the temperature in the furnace, and the second is within the plasma heating system.

PTC is equipped with Plasma Heating System (PHS), acting as a source of heat. Organic substances evaporate to volatile carbohydrates, carbon oxide, etc., while the non-combustible and other non-organic ingredients melt and transform into vitrified slag. Plasma melting is a high-energy technology able to process a large range of waste. In this technology a thermal plasma field is created through directing electric current through low-pressure gas stream (air used plasma gas). The intensive high-temperature zone may be used for decomposition of wastes to their chemical elements through injecting in the plasma or through use of plasma arc as a heat source for incineration or pyrolysis.

When PTC is full of treated product (molten slag), the process of feeding must be interrupted and the process of casting the formed slag can begin. The slag casting cycle is a semi-automatic process. After the slag mould is placed in its position, the locking system of the casting opening on the PTC side is opened by remote control. At the same time the furnace tilts so that the casting process can begin. As a result the slag is cast through a nozzle or funnel in the slag mould which is placed beforehand in a cooling mould. The end waste is further cooled in a slag collection chamber (SCC). This ventilated confinement consists of transporter where the mould is cooled, a casting position (including a lifting

device for reaching the casting nozzle) and feeding station in which, after cooling, the slag mould is placed through an airlock with a double lid in a 200-litre barrel. The prepared 200-litre barrel, which is practically without any external contamination, is transported to a temporary storage repository in anticipation of its final disposal.

The plasma furnace will be designed with fireproof concrete lining with high melting point. The furnace structure is cooled with water in order to ensure normal temperature on the surface of the chamber for primary treatment and to extend the life of the fireproof lining. The furnace operates in sub-pressure conditions of approximately 250 Pa(g) and is hermetically sealed, so that almost no cold air penetrates in it. Since no additional air comes into the furnace, organic waste does not melt, but transforms into gases. These gases are incinerated in the secondary treatment chamber (STC).

STC is a chamber with fireproof lining which receives off-gases from PTC. Non-combustible gases, carbohydrate, soot, CO, hydrogen, ash and volatile matter pass from the primary treatment chamber into the secondary treatment chamber (STC). Off-gases from PTC will enter STC with a nominal temperature of about 1,300°C, as their maximum temperature will not exceed 1,500°C. Gases mix with additional amount of air in order to complete oxidation down to primary components, such as CO₂, SO₂ and H₂O. The additional air quantity is regulated by a controller – oxygen analyzer at the outlet of STC to the minimum level of 6%.

STC is dimensioned in such a manner as to guarantee a minimum stay of two seconds for the waste at design feeding speed at minimum temperature of 850°C. The normal operation temperature is from 900 to 1,000°C. STC is equipped with fuel burner. This second burner operates on diesel fuel and has a strong and weak flame options as function of the temperature at the outlet of STC. The burner's strong flame is also used for heating the system during the preliminary heating cycle. The layer of the interior STC lining is designed to resist maximum temperature of 1,650°C.

After leaving STC the outgoing gases are directed to a purification system. The flue gases are first cooled in three-pass radiant heat boiler and then enter the bag house, where particulate matter is captured by surface filtration of membrane filter bags of Polytetrafluoroethylene (PTFE). The filter medium is cleaned by means of pulsed jets of compressed air; the collected particles are shaken off from the surface of the bags. The hopper at the bottom of the bag house receives the released particulate matter and emptying

is accomplished through a rotary discharge valve at the vibrating tube. In order to retain radioactive particles, the gases enter the HEPA filters downstream the fabric filters chamber (consisting of two parallel compartments – one compartment serves as standby). Two pre-filters with 90 % efficiency and two absolute filters with 99.97 % efficiency for particles larger than 0.3 μm are also installed.

The wet gas scrubbing assembly, installed after the HEPA filters, consists of a quencher tower for the cooling down of gases and counter current scrubbing tower with 99.99 % efficiency with caustic liquid for removal of HCl and SO₂, and a demister. The HEPA filters have efficiency of 99.97 %, and after the scrubber system efficiency of 99.99% can be assumed, considering the activity captured in the solid products (slag and ash) and liquid products (scrubber water).

Next to the scrubber assembly two extraction fans in parallel ensure the evacuation of flue gases (one fan is stand-by). The negative pressure in the whole system is controlled by frequency controlled motors of the above mentioned extraction fans.

Next to the fans a DeNO_x system is installed for reduction of nitrogen oxide concentration; this system comprises a heater for reaching the temperature necessary for catalytic reaction of denitrification of the flue gasses.

Prior to the flue gas evacuation to ventilation stack 2 (VS2) an emission control system will be installed (ECS) to control the parameters of chemical substances, such as CO, SO₂, NO_x, HCl, O₂, H₂O, NH₃ and total organic carbon (TOC), and also a dust control device. A system for continuous air sampling is also ensured, for the purpose of daily (24-hour period) measurement of radioactive releases. The capacity of the ammonia tank needed for the operation of the DeNO_x system is 5001 (25% NH₃).

The main parameters of PMF are as follows:

Performance	250 t/y
Feeding rate (per hour)	65 kg solid waste or 55-60 kg solid waste and 5-10 kg liquid waste
Discharge of flue gases	Nominal value: 1200-1400Nm ³ /h
Effective operation	4000 h/y
Specific radioactivity (incoming waste)	Maximum 5.17E+05 Bq/kg

In respect of PMF radiation protection considerations and measures for minimization of the

impact will be taken into account as per the Interim Safety Analysis Report (ISAR) of PMF.

The main activities in the construction of PMF include:

1. Dismantling works.
2. Temporary fortification of the concrete structure.
3. Fortification of the existing elements and installation of new.
4. Installation of supporting steel structure and reinforced foundations for the main and auxiliary equipment.
5. Disposal of construction waste and development of inner infrastructure.

The main processes during the stages of operation and decommissioning of PMF include normal operation modes in which various technological cycles of normal operation are carried out with a high degree of automation:

- **Preliminary heating cycle:** with a function for preliminary heating of the system to the operating temperatures so as to ensure complete incineration of organic waste;
- **Waste treatment:** after reaching the conditions of normal technological mode, the waste treatment may start;
- **Hot reserve state,** in order to preserve the high value of the temperature in the system;
- **Cold reserve state:** as the time for reaching the cold reserve state after activation of command for safe shutdown for a maximum of maximal four 24-hour periods depending on the temperature of PTC at the time of the command activation. This cycle is activated when PMF must be stopped and when a low temperature of around 60°C is reached. Sub-pressure is kept in the system.

The radioactive waste designated for treatment in PMF is classified as Category 2 under the Ordinance on safety in radioactive management, Category 2a – low and intermediate level radioactive waste predominantly containing short-lived radionuclides (with a half-life period not longer than that of Cesium-137), as well as long-lived radionuclides at considerably lower activity levels, restricted for the long-lived alpha emitters under 4x106 Bq/kg for each separate package and maximum average value of all packages in the respective facility of 4x105 Bq/kg”.

The waste for treatment at PMF is divided in two types – incoming waste from Kozloduy NPP, as well as secondary waste from the PMF operation. As a basis for control of incoming RAW for treatment the incoming control criteria of waste received at PMF will

be applied.

Solid radioactive wastes that will be treated at the facility are classified as low and intermediate level waste and their radiation characteristics correspond to Category 2a. Liquid RAW must have specific activity smaller than or equal to $4.00E+04$ Bq/kg.

RAW to be received at PMF, may be divided into two groups:

- organic waste, textile, paper, wood, polyethylene, polypropylene, polystyrene, various types of rubber, latex, Plexiglas, fluids absorbed in cellulose, textile and other organic absorbent material;
- non-organic waste: glass bottles or window glass, galvanized and non-galvanized steel, all types of granulates, such as concrete, sand, soils, asphalt and bricks.

The control over radiation characteristics of gas emissions is exercised after treatment by the extraction fans of the off- gas system and of the exit pipeline of PMF's extraction system. Non-radioactive emissions will be controlled by the continuous emission monitoring system. The emission control system will be installed at the end of PMF before the point of its connection to the ventilation system of AB-2.

Water release will be carried out from three sources: cooling water of the heat exchanger (boiler), cooling water of the burner and cooling water of the furnace. The fresh water will be added from the top on the scrubber depending on the level in the scrubber tank and the circulation pump will transport the water through the module.

Main processes in PMF decommissioning

Upon the selection of decommissioning strategy a number of factors have been taken into account, as currently the international trend is rather that of immediate dismantling. According to Principle 5 of the Principles of Radioactive Waste Management the decommissioning period must be such as “not to burden future generations unnecessarily” in terms of additional risks to health and safety, as preference is given to immediate dismantling as preferable decommissioning option.

Taking into consideration the residual activity in PMF in the course of decommissioning, the delay in decommissioning activities probably will not lead to any sensitive decrease in the activity of the residual nuclides or occupational exposure of the workers during their decommissioning activities. In accordance with the option for immediate dismantling of the equipment out of the safe enclosure zone, as per the updated Strategy for Decommissioning Units 1 to 4 of Kozloduy NPP immediate dismantling is accepted as a preferable option for

decommissioning of PMF.

After the final completion of PMF's operation, its decommissioning will be carried out in a manner ensuring radiation protection and safety for the staff and population, as well as protection of the environment. The decommissioning activities will lead to removal of existing components or systems, decontamination of components, as well as cutting and treatment of large parts of the equipment.

The processes of decommissioning are divided in three stages with various implementation periods as per ISAR of PMF and are as follows:

- Preparatory activities - 5 weeks;
- Activities of decontamination, dismantling and waste management - 18 weeks;
- Final inspection round - 2 weeks.

All incoming radioactive waste and end waste, generated at PMF are determined as Category 2a and therefore the contamination levels in the course of decommissioning are commensurate with that category of waste. RAW generated during the decommissioning activities will be classified and sorted subject to their physicochemical and radiation characteristics.

Depending on their residual activity the materials generated from decommissioning activities are classified in the following groups:

- 1) Clean materials – materials outside the controlled zone which are not subject to decontamination;
- 2) Waste materials subject to exemption from regulation – materials located within the controlled zone, but with low probability of containing any residual activity;
- 3) Radioactive waste materials – materials containing radioactivity or externally contaminated materials:
 - Category 1 – waste containing low level radionuclides in respect of which no radiation protection measures need to be implemented, or in respect of which high level of isolation and containment is not necessary;
 - Category 2a – low and intermediate level waste, containing short-lived radionuclides.

Metal materials will be placed in containers of 6m³ or barrels of 200 litres and will be transferred to the existing decontamination facilities for reduction of residual contamination and reviewed classification of the materials as subject of release from control.

PTC and STC which are removed in the course of decommissioning will be placed in 200-

litre barrels and super-compacted as envisaged for elements being removed during maintenance activities in the course of operation.

Waste that is subject of compacting, such as waste from technological processes, will be put in 200-litre barrels and will be additionally compacted and super-compacted in waste treatment facilities.

Dust and soot generated upon the purification of PMF in the course of decommissioning, especially of the off-gas system, will be collected in 200-litre barrels.

Toxic or hazardous waste, even though not radioactive, will be managed by authorized agents and disposed at specific location due to its toxic or hazardous nature.

Apart from primary waste generated immediately upon decommissioning of PMF, secondary waste will be generated as well, resulting from the performance of decommissioning activities, such as: dust and soot from the PMF's purification; metal debris resulting from cutting; technological process-related waste, such as protective apparel, polyethylene (PE) foil from temporary decontamination premises, etc.

The envisaged activities for decontamination and/or dismantling of PMF are:

1. Preparatory works ;
2. Equipment removal;
3. Removal of the additional equipment and platforms;
4. Final radiological inspection round.

At the plasma melting facility (PMF) use of water is planned for industrial and domestic needs, as the sources of its supply are those currently existing, as per the issued permits for water use. The cooling system of PMF will function along “closed circles” and therefore the water consumption will be limited to the amount of the possible leaks of the closed systems and is expected to be within 2 m³ per annum. For drinking and domestic needs water from the urban water supply system of the town of Kozloduy will be used, as there is a contract in place for such purpose executed with “Water Supply and Sewage” EOOD – town of Vratsa, as well as water from in-house sources. The scheme for service water supply of Kozloduy NPP from the Danube River is direct current-based, as it provides circulation water – for cooling turbine condensers; service water – for cooling other facilities.

The formed wastewater will be discharged in the Danube River through HC-1 and HC-2 and in the main drainage channel (MDC). The recipient of the water from MDC is also the

Danube River. The company is holder of permits for wastewater discharge:

PMF, as a part of the site of Kozloduy NPP is protected by the physical protection system of Kozloduy NPP, and therefore no measures are planned for additional physical protection or a change of the existing one.

As regards fire safety analysis is performed of the fire occurrence risk for PMF based on the design for PMF, on the instructions and requirements contained in the procedures for protection against fire and accidents of Kozloduy NPP. The construction of PMF will not lead to any changes in the existing programme for non-radioactive waste management on the territory of Kozloduy NPP.

PMF will be housed in an existing building and does not have any additional relation to the provision of utility services and the auxiliary infrastructure.

For the purposes of occupational health and safety Occupational Health and Safety Plan is elaborated in accordance with the requirements under Art. 10 of Ordinance No. 2 of 22.03.2004 on the minimum requirements for occupational health and safety conditions in the performance of construction and installation works. In the elaboration of the plan, all measures, rules, programmes and instructions on nuclear, radiation, fire, emergency and technical safety, in effect on the territory of Kozloduy NPP have been taken into account.

The investment proposal does not affect any protected areas (PA) in the meaning of the Protected Areas Act (PAA) and does not fall within the limits of any protected areas in the meaning of the Biological Diversity Act (BDA).

The nearest protected areas are BG0000533 “Kozloduy Islands, BG0000614 “Ogosta River”, BG0000508 “Skat River”, BG0000527 “Kozloduy”, BG0000199 “Tsibar” for conservation of natural habitats and of wild flora and fauna, and protected area BG0002009 “Zlatiyata” for protection of wild birds. Taking into consideration of the provision of Art. 31, para. 1 of the *Biological Diversity Act* and Art. 2, para. 1 of the *CA Ordinance*, the investment proposal is subjected to assessment in terms of its compatibility with the subject and objectives of conservation in the protected areas. After evaluation pursuant to Art. 39, para. 3 of the *CA Ordinance* that the investment proposal will probably exert a significant negative impact on natural habitats, populations and habitats of species, being subject of conservation in the protected areas pursuant to Art. 39, para. 5 of said Ordinance, a report is drawn up for assessment of the degree of impact on protected areas (EIAR). The expected impacts of the investment proposal on the subject and objectives of the protected areas

located nearby are reviewed in detail and assessed in EIAR, based on the following motives (factual grounds):

1. In the submitted EIA report the existing state of the components and factors of environment is reviewed and analysis is performed of the expected impacts from the implementation of the investment proposal on the environment and human health. The conclusion of the EIA expert team is that based on the analysis and assessment of the investment proposal, the performed research, consultations, as well as the forecasted impact of the facility on the components of environment, it is recommended to approve the implementation of the investment proposal along with the performance of the prescribed measures and recommendations, taking into consideration the following:

- The Strategy for Management of Spent Nuclear Fuel and Radioactive Waste adopted in 2011 by the Council of Ministers sets forth the construction and commissioning of Plasma Melting Facility (PMF). The volume reduction of RAW for disposal will lead to optimization of the costs on RAW management in long-term aspect. The commissioning of PMF is of significance not only for the activities of decommissioning of the shut down Units 1 to 4, but also for the operation of Kozloduy NPP as a whole.

- The selected PMF technology conforms to the requirements of IAEA for similar facilities for conditioning of RAW with a high volume reduction factor.

- Upon the implementation of the investment proposal and the activities of decommissioning Units 1 to 4 a cumulative effect is possible as regards radioactive aerosols, but it is negligibly small. The share of estimated quantities of radioactive substances in the gaseous releases from PMF relative to the total statistically average amount of gaseous releases for the past few years, through the ventilation stack of AB--2 is about 0.10%. The performed “Analysis of dose exposure of the population in the monitored 30-km zone of Kozloduy NPP” from the gaseous aerosol and liquid radioactive releases in the environment as a result of the process of decommissioning Units 1 to 4 and the emissions from the operation of the plasma melting facility (PMF) entails the following conclusions:

- the maximum annual effective dose of a representative of the critical group of population within the 40 km zone of Kozloduy NPP which includes the monitored 30 km zone, as a consequence of the liquid and gaseous-aerosol emissions in the environment in the past few years is about 5 $\mu\text{Sv/a}$ which is much lower than the dose quota of 250 $\mu\text{Sv/a}$

for exposure to NPP radioactive releases as per the Ordinance on ensuring the safety of nuclear power plants (OESNPP) and the norm of 1 $\mu\text{Sv/a}$ for each individual of the population, as per the Basic Radiation Protection Norms (BRPN-2012);

- the obtained additional exposure from radioactive releases in the environment is about 500 times lower than that of the natural radioactive background (2.33 μSv);

- the assessment of the cumulative impact from emissions in the environment upon decommissioning of Units 1 to 4 and the normal operation of the plasma melting facility, correlated to the impact upon normal operation of the functioning Units 5 and 6 of Kozloduy NPP shows that the maximum individual and collective effective doses will be increasing by 0.5 to 1%, which is negligible and falls within the limits of indefiniteness of the used assessment model;

- the conservative assessment of the annual effective doses of the population in the 40 km zone of Kozloduy NPP which is caused only by the aerosol emissions being assessed in the project for PMF, equaling 6 MBq, upon normal operation of the facility is assessed at $5.47 \cdot 10^{-10}$ Sv/a, which is only 0.01% of the total exposure caused by the operation of all facilities on the site of Kozloduy NPP;

- During the period of decommissioning the non-radiation pollutants from the PMF operation will be eliminated as its functioning will be terminated. Sporadic short-term emissions of gases from welding works are expected while applying thermal methods of cutting. These emissions will influence the quality of the ambient air in the region. They are of significance only from the viewpoint of occupational hygiene;

- In the course of decommissioning activities, the ventilation system with HEPA filters of AB-2 will be functioning. The expected emissions are insignificant and negligibly low. The conclusions are made based on the assessment provided by the Contracting authority of radioactivity on metal surfaces - 64MBq and of fireproof materials - 3GBq;

- The air pollution upon decommissioning of PMF will not have any influence on the air quality in the nearest populated areas;

- In the course of performing the activities of operation and decommissioning of PMF, including the activities of dismantling, no influence will be exerted on the gamma radiation background. The emissions of radioactive substances in gaseous during the operation and decommissioning of PMF are limited to the permitted levels of aerosols and consequently, are negligible in terms of impact;

- The regulatory admissible noise levels will be adhered to. Significant additional impacts from noise load from Kozloduy NPP site are not expected, taking into account the fact that PMF is installed in a detached building (AB-2). The impact will be local.
- The expected vibrations are insignificant in terms of impact on the staff at the site of Kozloduy NPP and are also of temporary and limited nature;
- The stated concentration values of dust, CO, SO₂, HF, HCl, total organic carbon (TOC) are below the admissible limits and are not expected to have any adverse effect on health;
- During the construction of PMF no impacts are expected on soils, the earth's interior and the geological base since the proposed location of PMF is within the limits of auxiliary building 2, in room BK301 on elevation +6.30m and in room BK039/3 on elevation +0.00m;
- In normal operation PMF will not be a source of impact on soils;
- During the normal operation period of PMF no negative non-radiation impacts are expected on soils within the 30 - km monitored zone around Kozloduy NPP, including the part from the territory of Romania, which falls within the zone;
- During the normal operation period no impact by non-radiation factors on the earth's interior is expected;
- The normal operation of PMF is not expected to be a source of radioactive contamination of soils on the territory of Kozloduy NPP and in its vicinity. Therefore, upon normal operation of PMF no radioactive contamination of the earth's interior, as well as of Kozloduy NPP's proper site and adjoining land areas, is expected;
- The impacts on the environment and in the event of accidents are expected to be only local and temporary, until managing the accident. Upon taking appropriate procedural actions the possibility of transboundary impact and negative effect on the neighbouring Romanian territory (including the earth's interior) is excluded;
- In the course of decommissioning the expected emissions of radionuclides in the air and water is expected to be insignificant and negligibly low and therefore, no soil contamination is expected on the site of Kozloduy NPP and in its proximity on Bulgarian and Romanian territory. No impact is expected on geological environment and the earth's interior in the course of decommissioning of the facility if the Programme for decommissioning and the radiation protection procedures are strictly observed.

The probability of contaminating the earth's interior as a result of accidents in the course of

decommissioning is insignificant due to the performance of the activities indoors. No cumulative effect is anticipated;

- The quantities of water used for drinking and domestic water supply and for production needs are within the limits of the permitted quantities;
- Taking into account the treatment of wastewater by the scrubber and of the water from the coolant module by the wastewater treatment system of Kozloduy NPP, it may be determined that radioactivity released in the Danube River is much below 400 KBq/per annum, i.e., it is negligibly low. The cumulative effect is insignificant in respect of the wastewater quantities;
- In the process of decommissioning the impact on surface water and groundwater is expected to decrease. It will have a fading effect and will result in the indicators for the chemical state and the general ecological state of the Danube River, the water body, in which wastewater from Kozloduy NPP is discharged;
- In normal technological mode of PMF no negative impact is expected on the flora and vegetation on the site of Kozloduy NPP and out of it. No cumulative effect is anticipated;
- In normal technological mode of PMF, based on the design solutions for off-gas treatment through a multi-stage system of treatment facilities, as well as supply of wastewater to the existing sewage system of Kozloduy NPP, no negative impact is expected on the fauna on and off the site of Kozloduy NPP, and taking into account the protective and monitoring activities at Kozloduy NPP applied hitherto. No cumulative effect is anticipated;
- During the operation of the investment proposal no impact on landscapes is expected since the operation of PMF will be performed within an existing indoor area within the site of Kozloduy NPP.
- During the operation of PMF and the decommissioning, no impacts are expected on the natural and territorial complexes within the limits of the monitored 30 km zone around Kozloduy NPP, as well as on the Romanian territories falling within the zone. No cumulative effect is anticipated;
- Upon normal technological mode functioning of PMF no negative impact is expected on PA and PZ;
- Upon the implementation of the investment proposal no impact from non-radiation and radiation sources is expected on land use and they will not influence the use of lands in the

region, since no utilization of agricultural lands is envisaged in order to implement PMF. No cumulative effect is anticipated.

- No harmful impacts are expected on cultural and historical heritage since the implementation of the investment proposal is restricted within the site of Kozloduy NPP where no cultural monuments or archaeological finds are identified;
- The implementation of IP will not influence in a negative manner the infrastructure of the municipality and the region. The establishment of new infrastructure (road, etc.) is not necessary, since the existing infrastructure will be used. No cumulative effect is anticipated.
- All activities which will be performed during the construction, operation and decommissioning of PMF are complied with the requirements for safe and healthy occupational conditions and protection of the population's health. Upon adherence to the normal technological mode and the instructions on PMF decommissioning, and respectively, the systematic optimization of radiation protection of the staff and population, the impact by exposure to radioactive materials will be minimal;
- During the installation activities some working teams will be exposed to general and local vibrations, to metal aerosols, to infrared and ultraviolet radiation (welding works). As regards the exposure to these non-radioactive factors there are efficient means for collective and personal protection and their use will minimize the adverse health effect which will be local and having an effect of short duration;
- The health risk to the population, as a result of the implementation of the investment proposal, tends to zero, given the fact that hazardous radioactive materials, as well as construction activities that are a source of non-radioactive harmful impact, will not go beyond the territory of the NPP's site, which is confirmed by the performed "Analysis of the effective dose of the population in the monitored 30 km zone of Kozloduy NPP from gaseous aerosol and liquid radioactive releases in the environment from the process of decommissioning power units 1 to 4 and the emissions from the operation of the plasma melting facility;
- In compliance with all planned measures for installation, instructions for the operation and decommissioning of PMF the implementation of the investment proposal will not exert any negative impact on the state of the environment, nor contribute to harming the health of the staff on the site of Kozloduy NPP and of the population in the monitored 30 km zone around it. No cumulative effect is anticipated.

- In socioeconomic aspect no negative non-radiation impacts are expected also on the population living on the territory of the Romanian side;
- Upon decommissioning PMF no negative non-radiation impacts are expected in socioeconomic aspect on the population within the Bulgarian side of the 30 km zone of Kozloduy NPP;
- The activities in performance of the Plan for decommissioning of PMF, provided that the envisaged measures and activities are strictly applied in relation to the staff and population safety and the prevention of any contamination of the components of the environment, would not lead to radioactive contamination. Therefore, no radiation impacts are to be expected both on Bulgarian and Romanian territory falling within the borders of the monitored 30 km zone of Kozloduy NPP;
- Based on the performed analyses of the effective dose of the population from the operation of Units 5 and 6 for 2010, from the process of decommissioning of Units 1 to 4 of Kozloduy NPP and from the normal operation of the plasma melting facility, the following conclusions can be drawn:
 - The conservative assessment of the annual effective dose of a representative of the critical group of the population within the 40 km zone of Kozloduy NPP, resulting from the liquid and gaseous emissions in the environment, during the past few years, is of the order of a few micro-siverts ($\mu\text{Sv/a}$), which is much lower than the quota of $250 \mu\text{Sv/a}$ for exposure to radioactive releases from the facilities on the site of Kozloduy NPP and is lower than $10 \mu\text{Sv/a}$, which, as per the criteria of the International Commission on Radiological Protection is considered negligibly low;
 - The obtained additional effective dose is around 500 times lower than that of the natural radiation background ($2.33 \mu\text{Sv}$);
 - The assessment of the cumulative impact by emissions in the environment upon decommissioning of Units 1 to 4 and normal operation of the plasma melting facility correlated to the impact in normal operation of the operating Units 5 and 6 of Kozloduy NPP shows that the maximum individual and collective effective doses will increase by 0.5 to 1%, which is negligible and is within the indefiniteness range of the applied assessment model;
 - The conservative assessment of the annual effective dose of the population in the 40km zone of Kozloduy NPP resulting only from the aerosol emissions assessed in the PMF

design, equaling 6 MBq, in normal operation of the facility, is assessed at $5.47 \cdot 10^{-10}$ Sv/a, which is only 0.01% of the total exposure resulting from the operation of all facilities on the site of Kozloduy NPP;

- The results obtained from the modelling analysis show that the exposure of the population is very low and is comparable to the natural radiation background, and therefore the impact from the operation of PMF is insignificant;

- Comparisons of the collective effective doses of the population for Kozloduy NPP with the same indicators for many other NPPs with PWR (WWER) reactors, evidence comparability;

2. In respect of the probable degree of negative impact the evaluation that the investment proposal is not likely to exert any significant negative impact on natural habitats, populations and habitats of species, being subject of conservation in the aforementioned protected areas, is based of the following motives:

2.1. The implementation of IP will not lead to any significant negative impact on the subject and objectives of the nearest protected areas BG0000533 Kozloduy Islands, BG0000614 Ogosta River, BG0000508 Skat River, BG0000527 Kozloduy and BG0000199 Tsibar for conservation of natural habitats and wild flora and fauna, since:

2.1.1. The implementation of the investment proposal is not related to utilization of areas falling within the scope of the protected areas so that it will not cause a distortion of their **integrity, structure and functions**, nor entail any significant negative indirect and direct impacts on **natural habitats, habitats of species**, being a subject of conservation therein;

2.1.2. The implementation of the investment proposal will not lead to **fragmentation** of natural habitats and habitats of species, being subject of conservation in the protected areas located in the proximity, since its implementation will be carried out on the already existing site of Kozloduy NPP, in a room in already existing building, which is outside the borders of any protected areas;

2.1.3. As per the research conducted in 2010 and 2011 it is established that radioactivity in the tested samples is within normal limits which presupposes that there will be no change in the **number and structure** of the species populations being subject of conservation in the protected areas as a result of the IP implementation;

2.1.4. It is not expected for the activities of construction of a “Facility for treatment and conditioning of radioactive waste (RAW) with high volume reduction factor in Kozloduy

NPP”, to cause any **noise** burden which could lead to a significant **disturbance** resulting in the species leaving the area, given the fact that the implementation of the investment proposal will take place in indoor premises on the site of Kozloduy NPP;

2.2. The implementation of the investment proposal will not entail a significant negative impact on the subject and objectives of conservation in the protected area BG0002009 “Zlatiyata” for conservation of the wild birds located nearby, given the following circumstances:

2.2.1. The implementation of the investment proposal will take place at an existing room in an existing building on the site of Kozloduy NPP, and therefore the **integrity, structure and functions** of protected area BG0002009 “Zlatiyata” for conservation of wild birds will not be affected since it is not related to utilization of any areas falling within its scope;

2.2.2. As per the research carried out by the authors of EIAR, the site of Kozloduy NPP remains at about 3 km to the east of the main migration way across the protected area, and therefore it is not expected that the implementation of the investment proposal will lead to destruction of any key areas of significance for the **migration** of wild birds;

2.2.3. The investment proposal will be implemented on the already existing industrial site of Kozloduy NPP, and therefore no significant negative impact is expected on any major **nesting and feeding habitats** and **resting places** of birds being subject of conservation in the protected area, as well as **fragmentation** of their habitats;

2.2.4. No **disturbance impact** is expected on birds during the performance of the investment proposal given the fact that its implementation will take place in an indoor area of an existing building on the site of Kozloduy NPP;

2.3. No significant negative impact is expected on the subject of conservation in the nearby located 6 protected areas as a result of **cumulative impact** from the implementation of the present investment proposal along with any past, current and future plans, programmes, projects and investment intentions;

3. The Danube Region River Basin Management Directorate with centre Pleven (RBMD) has rendered a statement with ref. No. 1582/07.03.2012 stating that the investment proposal is admissible from the viewpoint of achieving the environmental objectives and measures for attaining good state of waters and their protection zones underlying the River Basin Management Plan (RBMP) for the Danube region. RBMD, in the conclusion of its statement in the meaning of Art. 4a, para. 1 of the **EIA Ordinance**, gives a motivated

assessment that no risk exists that the implementation of the investment proposal will exert any significant impact on water and water ecosystems, given the compliance with the measures under RBMP for protection of surface and groundwater from contamination and in accordance with the planned strict monitoring of radiological and non-radiological state of surface water and groundwater in the area around the site, as well as of storm water and wastewater. In respect of the quality of the EIA Report, RBMD expresses its positive statement by letter with ref. No. 6208/10.05.2013.

4. In relation to the provision of Art. 14, para. 2, i. 1 of the *EIA Ordinance*, the Ministry of Health (MH) by letter with reg. No. 04-09-282/23.05.2013, gives a positive assessment of EIAR on condition that the commentaries specified in the statement are complied with. By letter with reg. No. 04-09-282/12.07.2013 the Ministry of Health confirms the provided positive assessment of EIAR by expressing a statement that the EIA Report comprehensively analyzes the information as regards the radioactive impact of the facility and the risk to human health.

5. In pursuance of the provisions of the *Convention on Environmental Assessment in Transboundary Context* the Republic of Bulgaria notifies Romania as a country concerned by the investment proposal. In response, by letter No. 28/L.B./22.02.2012, the Romanian side expresses a wish for participation in the EIA procedure. In the course of the EIA procedure, an assignment is provided to Romania about the scope of EIA, in response to which by letter No.36740/RP/01.10.2012, the Ministry of Environment and Forests of Romania expresses its statement. By letter with ref. No. EIA-220/21.08.2013 MOEW provides information to Romania about the access to the EIA Report and the Appendices thereto in English language. By letter with ref. No. EIA-287/10.09.2013 MOEW informs the Ministry of Environment and Climate Change of Romania on the public discussion meetings on Bulgarian territory with a provided opportunity for participation of the public and the institutions of the concerned country. By letter with No. 3947/RP/24.09.2013 the Ministry of Environment and Climate Change of Romania notifies MOEW that it will not take part in the public discussions on Bulgarian territory, expressing a wish though for a public discussion meeting to be conducted in respect of EIAR on the territory of Romania, in the town of Bechet on 15.10.2013. By letter with No. 3947/RP/31.10.2013 the Ministry of Environment and Climate Change of Romania provides commentaries on the EIA documentation. In response, by letter with ref. No. EIA-277/20.12.2013 MOEW sends the

statement to the Contracting authority in relation to the notes made in Romania on EIAR, while informing on the forthcoming adoption of a decision on EIA as regards the investment proposal. Within the specified term until 15.01.2014 no response has been received at MOEW from the Ministry of Environment and Climate Change of Romania.

By letter No. 3947/RP/06.02.2014 the Ministry of Environment and Climate Change of Romania provides its final statement on the investment proposal by making proposals which are included as conditions in this Decision on EIA.

6. In the course of the EIA procedure consultations are held with the concerned stakeholders and authorities. Public access is provided to the EIA report with all appendices thereto, and public discussion meetings are organized on 26.09.2013 and on 27.09.2013 in Miziya and Kozloduy, the municipalities determined as affected, as well as on 15.10.2013 in the town of Bechet, Romania, taking into account the stated wish on the part of the concerned country. In the course of the public access provision to the EIA documentation 8 written statements are submitted to Kozloduy NPP EAD with opinions and proposals, as all of these are positive and in support of the implementation of the investment proposal. No other statements are lodged during the public discussion meetings.

In pursuance of the requirements under Art. 17, para. 5 of the *EIA Ordinance* a written statement with ref. No. EIA-277/08.10.2013 is submitted to MOEW by the Contracting authority in respect of the proposals, recommendations and opinions resulting from the public discussion of the EIA Report.

As regards the statement submitted under ref. No. EIA-220/12.11.2013 at MOEW by the Ministry of Environment and Climate Change of Romania on the EIA Report in response, the Contracting authority has presented by letter with ref. No. 26-00-3408/03.12.2013 to MOEW and in compliance with Art. 17, para. 6 of the *EIA Ordinance* its opinion that no supplementing of the EIA Report is necessary as per the motives specified in each one of the written commentaries, as said opinion is provided to the concerned country by letter with ref. No. EIA-277/20.12.2013 of MOEW.

Within the one-month term envisaged under the *CA Ordinance* for public access to EIAR (as of 31.05.2013) no motivated written statements are received with information in the meaning of Art. 39. para. 10 of said Ordinance, respectively, Art. 17, para. 7 of the *EIA Ordinance* in respect of the nearest protected areas BG0000533 Kozloduy Islands, BG0000614 Ogosta River, BG0000508 Skat River, BG0000527 Kozloduy, BG0000199

Tsibar for conservation of natural habitats and of the wild flora and fauna, and protected area BG0002009 Zlatiyata for conservation of wild birds.

7. By its decision 1-2/2014 of 20.02.2014 the High Expert Ecological Council suggests an approval of the investment proposal also under the following conditions:

I. For the design phase:

1. First protective barrier of PMF shall be designed for preventing the spread of radioactive contamination in the room in which its treating facility will be located (feeding system, plasma furnace, secondary treatment chamber and flue gas purification system). The physical boundaries of the technological process shall be determined by the individual enclosures, mechanical equipment, containments and vessels.

2. Second protective barrier shall be designed, which will include adjustment of sub-pressure conditions in the premises in which equipment containing radioactive waste is located. Maintaining the sub-pressure parameters in all operation conditions of the facility shall be guaranteed. All waste gases shall be discharged to the ventilation stack of AB-2, after passing through various stages of purification by the existing and newly installed filters.

3. As a third barrier is to be envisaged the PMF building itself, in which it is necessary to maintain air sub-pressure conditions in the course of the work. For this purpose, the ventilation system of the building is to ensure lower air pressure than that in the exterior zone, extraction of air with potential radioactive contamination from the internal parts through HEPA filters before releasing it through the ventilation stack of AB-2 in the environment.

4. Instructions shall be elaborated for periodic cleaning in the course of performance of repair activities, for prevention of accumulating of radioactive contamination throughout the period of operation.

5. In the implementation of the investment proposal it is necessary to comply with Art. 46, para. 2 of the Water Act (WA) and with measures for protecting groundwater from pollution taking into account the prohibitions set forth under Art. 118a, para. 1, items 2 to 5 of WA.

6. The permits issued under WA to Kozloduy NPP for water abstraction and use of water site must be amended if during the development and operation of PMF the parameters under the already issued permits for water abstraction and wastewater discharge cannot be

complied with.

7. Environment management plan shall be drawn up in order to set forth the responsibilities of Kozloduy NPP in the process of assessment, management and monitoring of ecological issues and shall include the stakeholders concerned by the investment proposal as an integral part of this process.

8. An individual monitoring plan for the site shall be elaborated and included as an integral part in the Monitoring plan of Kozloduy NPP and shall guarantee that no unforeseen impacts occur and the proposed mitigating measures are effective and have an adequate effect.

II. For the construction phase:

1. In all cases on the locks or lids opened for repair or inspection purposes and which are considered critical in respect of the potential spread of radioactive contamination, temporary partitions shall be mounted consisting of aluminum frame and synthetic foil (e.g., above PTC upon replacement of the fireproof lining).

2. Gas purification system shall be developed to ensure reaching values lower than those specified below: total dust - $1\text{mg}/\text{m}^3$; CO- $5\text{mg}/\text{m}^3$; TOC- $1\text{mg}/\text{m}^3$; HCl - $1\text{mg}/\text{m}^3$; HF- $1\text{mg}/\text{m}^3$; SO₂- $5\text{mg}/\text{m}^3$; NO_x - $100\text{mg}/\text{m}^3$; heavy metals: sum of Cd and Tl - $0.005\text{mg}/\text{m}^3$; Hg- $0.005\text{mg}/\text{m}^3$; sum of Sb, As, Pb, Cr, Cu, Mn, Ni, V, Sn- $0.05\text{mg}/\text{m}^3$; dioxins and furans – $0.01\text{ ng}/\text{Nm}^3$.

3. Continuous monitoring programme shall be elaborated for the emissions of waste gases which shall be submitted to RIEW -Vratsa and ExEA for coordination.

4. Systematic measurement shall be carried out of the external exposure of construction workers, as well as measurement of radionuclides entry in human organism and determining the internal exposure dose.

5. The monitoring plan for the site shall be implemented as per i. 8. of the design phase. In the event of any unforeseen impact occurrence adequate measures shall be taken for its elimination.

6. The Emergency plan of Kozloduy NPP, drawn up in compliance with the Safe Use of Nuclear Energy Act (SUNEA), the Disaster Protection Act and the Ordinance on emergency preparedness in the event of nuclear or radiation accident, as in its scope actions shall be embedded for prevention of accidents or incidents in PMF. In accordance with the Emergency Plan of Kozloduy NPP there shall be established and maintained procedures

and instructions for actions in case of accidents corresponding to the relevant risk.

7. Upon a change in the type and quantities of the used hazardous chemical substances within the scope of Appendix No. 3 to EPA in relation to the implementation of the investment proposal, the classification of the entire enterprise is to be reviewed and updated, as the latter shall be submitted to the Minister of Environment and Water in accordance with Art. 103 of EPA.

8. If necessary and in accordance with i. 7 the documents under Art. 110, para 1 i. 1 and 2 of the Environment Protection Act shall be reviewed and updated (safety report and emergency plan of the enterprise) for the purpose of elaborating and applying adequate measures for prevention of big accidents and limiting their consequences in respect of the activities and/or processes involving hazardous chemicals, within the scope of the investment proposal. The updated documents shall be deposited for review at MOEW, for the purpose of assessing the necessity of reviewing the permit issued under Art. 116d in conjunction with Art.116b of EPA.

9. The assessment under Art. 9 of the Ordinance on the procedure and method of storing hazardous chemical substances and mixtures shall be reviewed and updated, based on which technical, managerial and organizational measures ensuring the safe storage of dangerous chemical substances and mixtures used at the site of the enterprise in relation to the implementation of the investment proposal shall be provided for.

10. Before the commissioning of the facilities and installations, the Contracting authority shall prepare its own assessment of possible cases of imminent threat of ecological damages and of inflicted ecological damages, for the activities within the scope of application of the *Act of environmental responsibility with regard to the prevention and recovery of environmental damage*, as per Appendix No. 1 of Ordinance No. 1 of 29.10.2008 *for the type of preventive and recovery measures in the cases envisaged under Act of environmental responsibility with regard to the prevention and recovery of environmental damage and the minimum amount of the expenses for their implementation* (promulgated in SG, issue 96/07.11.2008) and submit same to RIEW – Vratsa.

III. For the operation and decommissioning phase:

1. The treatment of non-radioactive waste shall be carried out in compliance with the requirements under the Waste Management Act and regulations on its application.

2. Periodic cleaning of the respective components in PMF shall be performed by specially adapted vacuum cleaner in order to reduce to a minimum any contamination spread. The vacuum cleaner is used for cleaning the fireproof concrete of PTC upon repairs, the internals of STC, the boiler, the bag house, the HEPA- filters, the ash collection confinement, etc., as well as the surrounding space during and after the performance of any repair activities.
3. Before the planned shutdown of PMF the last batch fed into the system shall be with very low radioactivity for lowering the residual radioactivity in the various components and in practice, it is washed away.
4. Upon repair or inspections of the confinements there shall be used additional personal protection equipment for the body and respiratory system in order to protect the staff performing the repairs, from radioactive contamination.
5. The staff responsible for radiation protection shall perform periodic inspections around the PMF equipment in order to establish the occurrence of any contamination at an earlier stage.
6. The programmes required under the effective standards and related to ensuring radiation protection of the facility shall be efficiently applied, maintained and if necessary, updated.
7. After the treatment, RAW shall be integrated in a matrix form which is to serve as an inherent physical barrier against the spread of any radionuclides from RAW.
8. The best available practices in technological process and technical maintenance shall be observed in the normal operation of PMF.
9. The radiation protection programme shall be applied not only upon threat of accident.
10. Any incidents of importance for safety shall be promptly reported by the management of Kozloduy NPP, SE RAW and the supervision authorities.
11. Upon any occurrence of accident within the 30 km zone of impact of Kozloduy NPP which is caused by the functioning of PMF, the Romanian local authorities shall be immediately informed and recommendations shall be provided for protection of the population under the same conditions under which this is done for the Bulgarian population.
12. For the purpose of notifying the population of Romania, information shall be periodically provided to the Romanian local authorities on the results from the monitoring within the 30 km zone of impact of Kozloduy NPP.

IV. Plan for implementation of the measures under Art. 96, para. 1,i. 6 of EPA.

No.	Description of the measure	Period/ Phase	Result
1.	Establishment, maintenance and regular update of Instruction for radiation protection of the site; Instructions for actions of the staff in emergency situation, including measures for fire and accident protection.	Design, Operation, Decommissioning	Provides radiation protection of the staff servicing the facility. Protection of human health and environmental components.
2.	Establishment, maintenance and regular update of Internal regulations and/ or procedures for the order and method of receiving, storage, return and accounting of sources of ionizing radiation (SIR) at the facility.	Design, Operation, Decommissioning	Provides radiation protection of the staff servicing the facility. Protection of human health and environmental components
3.	Establishment of procedures for RAW management depending on the type, generation method and subsequent treatment.	Operation, Decommissioning and closure	Environmentally friendly waste management and health risk minimization
4.	Keeping reporting documents and database for tracking of wastes in the process of receiving, treatment and storage.	Design, Operation, Decommissioning	Environmentally friendly waste management and health risk minimization
5.	Establishment, maintenance and regular update of Internal Rules and Procedures for collection, sorting, treatment, delivery, storage and reporting the RAW generated at the facility.	Design, Operation, Decommissioning	Occupational hygiene and safety
6.	Establishment, maintenance and regular update of Internal Rules and Procedures for use of personal radiation protection equipment for the staff and for ensuring personal hygiene from the point of view of radiation.	Design, Operation, Decommissioning	Occupational hygiene and safety
7.	Establishment, maintenance and regular update of Internal Rules and Procedures for radiation monitoring at the facility and for individual	Design, Operation, Decommissioning	Protecting the health of the staff, the population and the environment

No.	Description of the measure	Period/ Phase	Result
	<p>dosimetric control of the staff.</p> <p>Review and update of the existing programme for radiation monitoring in the zone of preventive protection measures and the monitored zone around the facility.</p>		
8.	Appointment of qualified staff in charge of radiation protection	Operation, Decommissioning	Protection of human health and environmental components
9.	Establishment, maintenance and regular update of Internal Rules and Procedures for the order and method of admittance to work with radioactive materials and equipment with radioactive contamination and for conducting of initial, current and periodic instruction courses and checking the knowledge of the staff.	Operation, Decommissioning	Protection of human health and environmental components
10.	Establishment, maintenance and regular update of job descriptions of the staff in their part related to activities in an environment with ionizing radiation and radioactive contamination.	Operation, Decommissioning	Protecting the health of the staff, the population and the environment.
11.	Establishment, maintenance and regular update of rules for admission and provision of radiation protection upon elimination and restriction of the consequences from any accident arisen at the facility.	Operation, Decommissioning	Protection of human health and environmental components
12.	Classification of work places and radiological areas in PMF, ensuring proper control on the admission of the staff thereto.	Operation, Decommissioning	Minimization of the occupational health risk
13.	Performance of regular dosimetric control of the PMF operating staff in compliance with the requirements of the Ordinance on Basic Norms	Operation, Decommissioning	Minimization of the occupational health risk

No.	Description of the measure	Period/ Phase	Result
	of Radiation Protection and Ordinance No. 32/7.11.2005.		
14.	Performance of continuous automated control of the equivalent dose rate and of the radioactive aerosol content in the ambient air in the PMF premises.	Operation, Decommissioning	Minimization of the occupational health risk
15.	In the PMF surveillance zone protection apparel shall be worn as well as additional personal protection equipment required under the instructions.	Operation, Decommissioning	Minimization of the occupational health risk
16.	When work is performed in areas with probability of air active contamination or not captured surface contamination, the use of protective means for the respiratory system is imperative.	Operation, Decommissioning	Minimization of the occupational health risk
17.	Monitoring of the occupational health of the operation and maintenance staff shall be conducted, in accordance with the national statutory requirements and the rules of Kozloduy NPP.	Operation, Decommissioning	Minimization of the occupational health risk
18.	Execution of all medical and prophylactic measures applied at Kozloduy NPP for the class A staff working in the surveillance area.	Operation, Decommissioning	Minimization of the occupational health risk
19.	At the outlet of the off-gas cleaning system continuous emission monitoring equipment shall be installed to verify that all off- gases are measured before their release in the ambient air so as to guarantee the compliance with the admissible limits under i.2, II. of this decision and with the EU document recommendations.	Design, Construction, Operation	Minimization of health risk for the population. Environmental components protection

No.	Description of the measure	Period/ Phase	Result
20.	Performance of continuous monitoring of radioactive releases through the ventilation stack of AB-2.	Operation	Minimization of health risk for the population.
21.	Prevention activities related to public disclosure of the occurrence of any incidents and accidents.	Operation, Decommissioning	Minimization of health risk for the population.
22.	Maintenance and continuous update of all operational documentation – instructions, orders, report books, etc.	Operation	Achievement of optimal operational conditions for the purpose of avoiding any incidents or improper functioning and releases in the atmosphere.
23.	Maintenance of the components of the off-gas cleaning system in order to maintain and improve its efficiency.	Design, Construction, Operation, Decommissioning	Minimization of health risk for the population. Environmental components protection
24.	Envisaged measures for guaranteeing that during normal operation, expected operational states and design basis accidents in the facility the dose limits established under Art. 8, i. 1 and Art. 9 will not be exceeded for the period after closure of the facility, as per the Ordinance on safety during RAW management.	Design, Operation, Decommissioning	Health risk minimization Environmental components protection
25.	A review of the existing radiation monitoring programme on the site of Kozloduy NPP is to be performed, given the existence of the plasma melting facility, and if necessary, new control points are to be determined.	Design, Construction, Operation, Decommissioning	Health risk minimization. Environmental components protection
26.	Intensified control of the staff effective dose shall be carried out during the activities of	Decommissioning	Minimization of the occupational health risk.

No.	Description of the measure	Period/ Phase	Result
	dismantling.		
27.	Primary wastewater collection and measurement of their respective characteristics. Wastewater discharge in organized manner and in accordance with the license conditions.	Design, Construction, Operation	Surface and groundwater protection against contamination
28.	Observance of the prohibition for the use of materials containing priority substances in developing structures, engineering facilities, etc., in the course of which contact with groundwater is made or is possible to be made.	Design, Construction	Groundwater protection
29.	Reconstruction or construction of new drainage system. Drained water collection in a receptacle for their treatment in appropriate manner depending on their radioactivity status.	Design, Construction, Operation	Surface and groundwater protection against contamination Minimization of the consequences in case of accidents.
30.	Introduction of special operating instructions aiming at the strict observance of the PMF process mode.	Operation,	Continuous control of the whole facility functioning to prevent leaks.
31.	Regular control and appropriate maintenance of the active drainage pipeline in order to prevent potential leakages and radioactive contamination.	Operation	Surface and groundwater protection against radiological impact
32.	Control of the compliance with the conditions under the issued permits for water use.	Construction, Operation	Protection of drinking and domestic water, regulation of water abstraction
33.	Control of the compliance with the conditions under the issued permits for discharge of generated wastewater.	Construction, Operation	Surface and groundwater protection against contamination
34.	Control of the compliance with the prohibition on direct discharge of water containing	Construction, Operation	Groundwater protection

No.	Description of the measure	Period/ Phase	Result
	hazardous and harmful substances in groundwater.		
35.	Optimization of water abstraction for industrial needs through the introduction of recirculation systems.	Construction, Operation	Protection of water resources
36.	Exercising control over the prohibitions on activities with priority substances which can lead to their indirect discharge in groundwater.	Construction, Operation	Groundwater protection against contamination
37.	Control of the industrial zones for production and hazardous waste.	Construction, Operation	Surface and groundwater protection against contamination
38.	Performance of monitoring of waste water for compliance with the emission norms as per the issued permits.	Construction, Operation	Protection of water against contamination with priority substances.
39.	Performance of monitoring of water and water sites influenced by wastewater discharge.	Construction, Operation	Protection of water against contamination with priority substances
40.	Implementation of monitoring programme for soils - 6 and 12 months after the startup of PMF. Determination of the content of radionuclides in the surface layer of 0-2cm, 2-5cm and 5- 10cm in set control points ob AB-2 site.	Design, Operation	Protection of soils and biological diversity
41.	Performance of regular monitoring, in accordance with the programme of Kozloduy NPP for soil monitoring at 36 points.	Operation,	Protection of soils
42.	Adherence to the best available modern practices for closure of such type of facilities.	Decommissioning	Protection of biological diversity
43.	Continuation of the practice of management of hazardous chemical substances and mixtures on the territory of Kozloduy NPP, as it shall also	Construction, Operation	Environmentally friendly management of waste and hazardous chemical substances

No.	Description of the measure	Period/ Phase	Result
	<p>encompass the substances needed for PMF's operation, including:</p> <ul style="list-style-type: none"> • Demanding from the supplier and keeping the updated status of safety datasheets (SDS) of hazardous chemical substances and mixtures at the places of their storage; • Performance of assessment and provision of measures for safe storage of the used hazardous chemicals, in compliance with the requirements under the <i>Ordinance on the procedure and method for storage of hazardous chemical substances and mixtures (Decree of the Council of Ministers No. 152 of 30.05.2011, promulgated in SG, issue 43 of 07.06.2011.)</i> • Use of hazardous chemical substances and mixtures in accordance with the measures for exposure control and safe use as specified in SDS. 		and mixtures and health risk minimization
44.	Management of construction waste in accordance with the Ordinance on management of construction waste and use of recycled construction materials (promulgated in SG, issue 89/13.11.2012).	Construction, Operation	Environmentally friendly waste management
45.	Introduction of the requirements under WMA for separate collection of waste from paper and cardboard, glass, plastic and metals, pursuant to Art. 33, para. 4 of WMA.	Construction, Operation	Environmentally friendly waste management
46.	Non-radioactive waste shall be delivered for subsequent treatment to companies holding permit under WMA or a complex permit under	Construction, Operation	Environmentally friendly waste management

No.	Description of the measure	Period/ Phase	Result
	the Environmental Protection Act.		
47.	Updating the record books for non-radioactive waste in accordance with Ordinance No. 2/2013 on the procedures and forms for providing information on waste management activities, as well as procedures for keeping public records (promulgated in SG, issue 10 of 05.02.2013)	Construction, Operation, Decommissioning	Environmentally friendly waste management
48.	In case of shortage of capacity of the existing warehouses for preliminary storing of non-radioactive waste, building of a site for temporary storage of waste before its delivery for recovery, including recycling.	Construction, Operation, Decommissioning	Environmentally friendly waste management
49.	Establishment of procedures for management of RAW, depending on the type, method of generation and subsequent treatment.	Operation, Decommissioning	Environmentally friendly waste management and health risk minimization
50.	Maintenance of accounting documents and database for tracking waste in the process of receiving, treatment and storage.	Operation, Decommissioning	Environmentally friendly waste management and health risk minimization
51.	Elaboration of a Project for PMF decommissioning. Part of this project shall be the procedures for waste activity determination in view of further treatment.	Decommissioning	Environmentally friendly waste management and health risk minimization

This Decision refers only to the investment proposal, which has been the subject of the performed EIA following the procedure provided for under the Environmental Protection Act. Upon extension or amendment of this investment proposal the Contracting authority must promptly notify MOEW at the earliest possible stage.

Pursuant to Art. 99, para. 8 of the Environmental Protection Act the EIA Decision loses its legal effect if within 5 (five) years as of its issue date, the implementation of the investment proposal has not started.

Upon change of the Contracting authority, the new Contracting authority shall notify

MOEW thereon on a mandatory basis pursuant to Art. 99, para. 7 of the Environmental Protection Act.

Upon establishment of any non-fulfillment of the conditions and measures under the EIA Decision the responsible persons shall be prosecuted pursuant to Art. 166, i. 2 of the Environmental Protection Act.

The stakeholders may appeal the Decision as provided for under the Code of Administrative Procedure within 14 day-term as of its notification.

Pursuant to Art. 60, para. 1 of the Code of Administrative Procedure the contracting authority Kozloduy NPP EAD has submitted a request to MOEW with ref. No.26-00-514/12.02.2014 for admission of preliminary execution of the Decision on investment proposal for the Facility for Treatment and Conditioning of Radioactive Waste with a High Volume Reductuin Factor at Kozloduy NPP

After I have reviewed the request of the company motivating in detail the protection of especially important state and public interests related to the timely implementation of the investment proposal I find that same are justified by the presence of the following prerequisites:

With the entry into force in 2002 of the Framewrok Agreement between the Republic of Bulgaria and the European Bank for Recovery and Development (EBRD), Kozloduy NPP EAD is granted the assignment to execute the closure of Units 1 to 4 of Kozloduy NPP and to elaborate the respective auxiliary projects for preparation of the decommissioning, assumed as a commitment to the European Commission (EC).

One of the key auxiliary projects is the project for development of Facility for treatment and conditioning of radioactive waste with high volume reduction factor at Kozloduy NPP. The implementation of this project is of essential importance for the successful decommissioning of Units 1 to 4 of Kozloduy NPP and respectively, for the fulfillment of the commitment assumed to EC.

The process of decommissioning comprises all administrative and engineering activities, taken to exempt the nuclear facility from regulation, including the closure of the facility for radioactive waste or spent nuclear fuel disposal.

By Decree No.3 of the Council of Ministers of 10 January 2013 the activities of radioactive waste management and decommissioning of nuclear facilities (Appendix to Art. 1, para. 1

Section V “Energy Sector”) are determined as strategic activities being of significance for the national security of the Republic of Bulgaria.

Under the conditions of the issued pursuant to Art.15, para.4, i.2 of the Safe Use of Nuclear Energy Act permit for design of a facility for treatment and conditioning of radioactive waste with a high volume reduction factor, a requirement for issuance of construction permit for the facility is the presence of positive decision on EIA as per the Environmental Protection Act.

Accordingly, a possible delay of the project for Facility for treatment and conditioning of radioactive waste (RAW) with a high volume reduction factor at Kozloduy NPP will result in non-fulfillment of the commitment assumed by the Bulgarian government to the European Commission, in non-performance of the Strategy for Management of Spent Nuclear Fuel and Radioactive Waste by 2030 and in violation of terms under Grant Agreement 005 executed with EBRD. This in turn, may give rise to the initiation of penal procedure against the Republic of Bulgaria for non-fulfilment or delay of a commitment assumed to EC.

For Kozloduy NPP EAD it is of essential significance to admit the preliminary execution of the Decision on EIA of the investment proposal for a Facility for treatment and conditioning of radioactive waste with a high volume reduction factor at Kozloduy NPP, since a delay in the implementation of the investment intention will constitute an infringement on a state interest expressed in non-performance of assumed commitment to EC, which will entail a financial penalty as well. The public interest will also be infringed on, since through the processes of treatment and conditioning of RAW the aim is to achieve a higher level of safety and protection of population and the environment upon their subsequent storage and disposal. Efficient minimization of RAW, attaining and maintaining a stable level of treatment and conditioning of generated RAW until their bringing to a form guaranteeing their safe subsequent intermediate storage, are among the main objectives under the Strategy for Management of SNF and RAW by 2030 which Kozloduy NPP EAD aspires to achieve.

The lack of ruling on preliminary execution of the Decision on EIA for PMF would constitute unjustified risk of a possible blocking of the construction activities on the project for indefinite term, which will additionally entail a substantial increase in the project’s price due to lodged claims for penalties by the Contractor under the project.

Not to be overlooked is also the possibility for contesting the Decision on EIA rendered by MOEW, since pursuant to Art.90, para.1 of the Code of Administrative Procedure with the submission of an appeal, administrative deeds are not executed until the dispute is resolved by the relevant authority.

On the grounds of the aforesaid, the admission of preliminary execution under the Decision on EIA for the investment proposal for Facility for Treatment and Conditioning of Radioactive Waste with High Volume Reduction Factor at Kozloduy NPP, is necessitated for the purpose of safeguarding state and public interests, since any delay in the implementation of the project may result in significant or hardly repairable harm.

The admission of preliminary execution of the Decision on EIA for the aforementioned investment proposal is a necessary security measure in view of ensuring the application of this administrative deed.

Now and therefore, I find that the request of the Contracting authority is tenable, as well as that the prerequisites under Art. 60, para 1 of the Code of Administrative Procedure are present.

I RULE AS FOLLOWS:

I hereby admit the preliminary execution of this decision for the purpose of defending especially important state and public interest.

This ruling is subject of appeal before the Supreme Administrative Court as provided for under the Code of Administrative Procedure within three days as of its notification.

Date: 27 February 2014

MINISTER: [ill. sgd.]

ISKRA MIHAYLOVA

[Round seal of the Ministry of Environment
And Water of the Republic of Bulgaria]