Standpoint of State Enterprise Radioactive Waste

According to Article 3, item 8 of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo convention) on proposals, suggestions, opinions and objections as a result of the conducted public discussion of the

Environmental Impact Assessment Report (EIA Report) for the investment proposal:

CONSTRUCTION OF THE NATIONAL DISPOSAL FACILITY FOR LOW AND INTERMEDIATE LEVEL RADIOACTIVE WASTE – NDF

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	**Standpoint and motives of the Employer State Enterprise Radioactive Waste**
	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forest on 29th June 2016.	
1	Protection in case of earthquake - up to how many Richter degrees is the deposit built to withstand?	The seismic is discussed in detail in section 3.3.5 Seizmic activity of Chapter 3 of the EIA Report. From the seismic-tectonic point of view, the region of the Radiana site is situated in the calmest area compared to other parts of Bulgaria. The seismicity of the region was thoroughly investigated in connection with the construction of the Kozloduy NPP. The main source of the seismic hazard for the Kozloduy area is the Vrancea seismic zone in Romania, which is situated at minimum distance of about 240 km from the Radiana site. Following the IAEA requirements the seismic hazard is assessed by both deterministic (DSHA) and probabilistic (PSHA) approaches. By this way the most correct assessment of the peak ground acceleration (PGA) can be obtained. In the case the value of the PGA=0.2g for an earthquake with 10000 years return period (one order of magnitude higher than the IAEA requirement for the LILW disposal facility) is defined for the all earthquakes with a magnitude (after Richter magnitude scale) M_w>6.5 generated by the Vrancea seismic zone including the three strongest earthquakes occurred in 1977, 1986 and 1990 with magnitudes Mw=7.5, M_w=7.2, M_w=7.0 respectively.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	**Standpoint and motives of the Employer State Enterprise Radioactive Waste**
2	What kind of cement or concrete reinforced with steel will be used to resist 375 years as you said?	The structures of NDF are designed and will be constructed entirely in full compliance with the system of standards EUROCODE, with adopting more conservative requirements from those laid down in the regulations parameters for structures related with the safety in short and long term aspect. The NDF structures are designed and shall be constructed in such a way that during the foreseen operational period to reliably : - withstand the impacts and influences that will occur during the implementation and operation thereof, and - maintain the required operational capability. The structure is designed to have sufficient load-bearing capacity, operability and durability. The design of the structure meets the criteria for reliability and conceptual requirements that shall be met. Structures having safety functions are designed for: - Class of responsibility CC3 according to BS EN 1990; - Class of reliability RC3 according to BS EN 1990; - Level of control over the design DSL3 according to BS EN 1990; - Level of inspection IL3 according to BS EN 1990. These structures are designed to continue to perform their safety functions at acceleration of the ground of 0,2g, according to accepted norms for construction of nuclear facilities and the IAEA recommendations. Determination of this ratio as adequate is based on the vast operational experience of NPP Kozloduy, and nearly half a century of seismic monitoring of the site performed by Kozloduy NPP.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		For the construction of the disposal facility will be used concrete that has the following characteristics: Concrete grade C35 / 45 BS EN 1992-1-1 and BS EN 206-1. Concrete grade on impact of the environment: - XC4: Cyclic wet and dry (bare concrete surfaces); - XF4: High water saturation with de-icing substances; - XA3: Highly aggressive chemical environment The concrete shall contain sulphate resistant cement according to BS EN 197-1 and should be manufactured in a manner which ensures water-tightness of structures. Reinforcing steel grade B500B according to BS EN 10080. It shall be also noted that additional measures are taken for hydroinsulation of the system by means of internal and external hydroinsulation. Last but not least, it should be noted that the construction of the repository is part of a multi-barrier protection of the disposal facility. The protective multi barrier system is described in detail in the EIA Report. We are going to emphasize here the important role of the fourth and fifth barriers for protection of the NDF structure. The natural barrier (the fifth barrier) represents the favorable conditions of the site which is selected after a site selection procedure described in detail in the EIA Report. Important relation to the durability of the structure of the NDF have the favorable geochemical characteristics of the natural environment, which exclude the presence of chemically active reagents, which may reduce the durability of the structure. Substantial importance for the durability of the construction has the multilayer protective cover, which will be constructed above the filled disposal facility and protects the structure from external influences. The

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		protective multi barrier cover is constructed entirely of natural materials (clay, sand, gravel, etc.) in order to: (1) minimize as much as possible the ingress of surface water ensuring infiltration hydraulic flow below 1.5 L/ m^2 per year in the repository modules; (2) serve as a barrier against external damaging of the system by human, animals or vegetation; (3) provide protection against long-term erosion agents, such as rainfall and wind. Within the Technical design is carried out a detailed analysis and assessment of degradation of the reinforced concrete components of the facility. The analysis examines the main physico-chemical processes of degradation of these structures. Within this study, it was found that: As a result of occuring carbonization is estimated that during 375 years the depth of the process with conservative assumptions will be 40.8 mm. Bearing in mind that the reinforcement of concrete is placed at at least 50 mm, leads to the conclusion that this process would not create conditions for beginning of the corrosion of reinforcement before 563.6 years. Degradation as a result of thermal cycles should not be possible, because the process is typical for surface structures and such buried up to 2-3 meters. Considering the depth of the buried cells below the multi-layer cover, the facility will be located in isothermal conditions. Nevertheless, in order to ensure the quality of the construction, in the Technical design is envisaged class of the concrete XC4 and XF4. Degradation by chemically aggressive environment is also not expected because geological and socio-economic factors do not suggest their presence on the site. However, the design envisages concrete XA3. For preventing and delaying alkali silikate reactions it is envisaged the concrete to be Na_2O Eq. <0.6% i.e. reactive alkali < 3kg/m^3, which in turn results in a practical halt of this degradation process over the period into

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		consideration. Based on these measures reinforced concrete structures should maintain their integrity not only for the entire institutional control period but also for considerable period thereafter.
3	What kind of steel container do you use or will you use and have a life expectancy of 375y as you asserted?	The containers for disposal of radioactive waste are described in detail in the EIA Report. These are reinforced concrete containers, not concrete containers. The reinforced concrete containers (RCCs) are with overall dimensions 1950 x 1950 x 1950 mm and useful volume 5m^3. Thickness of the walls is not less than 10cm, and thickness of the bottom is not less than 14cm. In line with the requirements of the Regulation on the conditions and procedure of transport of radioactive material, the RCCs provide equivalent dose rate at the surface ≤ 2mSv/h and equivalent dose rate level at 1 m distance from the surface ≤ 0.1mSv/h. The reinforced concrete containers are manufactured from concrete of strength class at least B25 and are provided with a protective coating on the outside and on the inside. The waste packages have sufficient structural rigidity to stack four of them one above another. The requirements concerning the structural properties of the concrete are as follows: • Strength indices not lower than 25 MPa; • Water impermeability not lower than 0.8; and • Cold endurance class F 100. In addition, the containers are seismically qualified to withstand 0.20g peak horizontal ground acceleration when stacked 4 containers high. The containers are produced by the staff of SERAW in strict compliance with the requirements of the technical documentation and the quality assurance program. Strict control of their quality is performed with program for tests developed in accordance with BDS and requirements of the International

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		Atomic Energy Agency. According to this program, every 50th container is subject of a test program, which includes: → Tests for waterproofing consisting of two types of testing: (1) pouring of the reinforced concrete container with water, mimicking intense rain; (2) filling the volume of the reinforced concrete container with water and stay for at least 48 hours → Test for free fall – the container is dropped onto a flat surface thus imitating the free fall of a filled container; → Tests on Drilling - on the upper surface of the container is dropped a steel rod → Pressure Test - the container is subject to a pressure exceeding five times its own weight → Tests for mechanical failure - falling from a height of 6 meters on a foundation → Tests for mechanical failure - falling from a height of 1 m onto a vertical steel rod → Tests for mechanical failure – onto the container is dropped a steel plate measuring 1m x 1m and with 500kg mass → Tests for fire resistance - the container is placed for 30 min in a burning hydrocarbon fuel at 800ºC → Tests for radiation protection on a specific methodology The containers comply with the requirements of the Regulation on the conditions and procedure of transport of radioactive material and the Safety standards of IAEA and they are certified by the Bulgarian Nuclear

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		Regulatory Agency as containers for transport and disposal. The reinforced concrete containers are part of the multi-barrier system of the NDF. Their disposal resource according to the Technical design (functions for retention and isolation) is calculated to cover 300 years period of institutional control. Under the conditions of Radiana site, the mechanism of degradation of the reinforced concrete is carbonation, which is a slow process and determines durability time considerably longer than 300 years. The protective characteristics of the reinforced concrete containers are provided by the following characteristics of the containers: → The reinforced concrete container has a special external and internal finish. It is alkaline, acid- and corrosion-resistant, thus eliminating the possibility of degradation of concrete due to chemical attack (alkaline or acidic) and prevents the initiation of electrochemical processes that result in corrosion of the metal structure of reinforced concrete container. → In addition to the protective coating, the reinforcement is integral (without welding) and is covered with a sufficiently thick layer of concrete, which provides the necessary corrosion resistance of the container. → The concrete is designed and manufactured with a combined use of the active mineral additives, wherein the respective compressive strength increase from 25 to 75% (above 40 MPa on the 28^{th} day) and the water impermeability is increased by 2 to 7 times in comparison with the common concrete mixtures, which ensures the necessary mechanical stability of the container. → The construction of container provides after filling the internal volume with waste, the lid to close hermetically (waterproof) to the body. In

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		addition, after placing the RAW in the reinforced concrete container, above it is poured a cement-sand mixture. Thus, the waste remains reliably and safely isolated from the environment. → the holds for handling of container have anti-corrosion cover guaranteed for not less than 50 years. Extension of this lifetime may be achieved through inspection of the holds for handling and carry out the necessary restoration measures. Additionally, measures to slow the degradation process of the container, the following operational measures are applied to ensure the prevention of degradation processes until the placement of the RCCs in the disposal cells of the NDF: → The quality of the materials in the production of container should be strictly controlled to prevent materials that could cause massive crystallization in the volume of concrete as a result of alkali-silicate reaction; → The RCCs are stored in places where no direct sunlight on container is allowed; → The RCCs are stored in conditions where is excluded the presence of aggressive chemical compounds (acids and bases), steam or water, increased concentrations of CO_2, S, Cl, Mg and other aggressive agents; → Storing packages in conditions virtually eliminating the conditions for fires and incidents involving the generation of high temperatures; → Before and after transportation, a check for mechanical violations of the special insulating coating is made. If necessary, it is recovered;

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
4	Why is not included the protection layer of lead?	The design of the NDF does not envisage the use of lead as a material for protection and decrease of the effective dose of the RAW disposed in the NDF because there is no need of construction of additional defence. It is well known that the concrete is efficient construction material which is widely used as a biological protection for decreasing the dose for personnel and the population. The design of the NDF envisages the RAW packages to be in reinforced concrete containers and the cells themselves to be constructed of solid reinforced concrete. The function of the reinforced concrete containers and reinforced concrete walls, floor and roof slabs of the cells for disposal as biological protection were confirmed by the performed analyses and assessments of expected doses to workers and the population. The results of these studies indicate that the expected dose is significantly lower than the limit values and does not involve increased risk to the health of any employee or member of the population, namely 18 µSv/yr. with admissible 100µSv/yr. if conservatively assumed that the exposed person lives at the fence of the NDF. Given that the nearest populated area is at a distance of 2500m for Bulgaria and 12km for Romania, this dose is not even possible to be measured as it is a thousand times lower than the natural background radiation and practically does not exist. In the international practice for radioactive waste disposal no lead screens are used. The reason for that is the toxicity of lead as a chemical pollutant. Even in case of most economical use of lead screens the pure lead will amount at 100 000 tons. The emplacement of such huge amounts lead will result in a chemical pollution of the close environment with this highly toxic metal. This large mass will load considerably the construction of the repository with all the resulting complications of the structure and will increase the risk for the facility as a whole, while from a radiological point of

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		view no contribution is expected, because even without this lead screen the dose for the populated areas is practically zero. As a result of this, as well as for the purposes of implementation of ALARA principle there is no reason or necessity from radiological, structural or economic point of view to use lead as a protection layer in the NDF. To the contrary, the use of lead as radiological biological protection would impose additional risk for the facility, the population and the personnel.
5	Where and how was it ensured protection of the waste from the decommissioned reactors so far?	The protection of radioactive waste from the decommissioning of Units 1-4 of Kozloduy NPP is analogous to the protection of the operational waste from units 1-6 of Kozloduy NPP. The question is discussed comprehensively in the EIA Report and is based on the multi-barrier engineering system described below: • **The first engineered barrier** is the waste form itself, which is cemented radioactive waste, some of which are preliminary put into steel drums with or without super compression. The safety function of the waste form (cement matrix in which the wastes are affixed) is related to the affixing of the radionuclides into the solid phase of the matrix as well as their retention by adsorption and precipitation in the alkaline media of the cement. Under the conditions of Radiana site, the mechanism of degradation of the first barrier is carbonation that is a slow process and determines time resistance of the first barrier of thousands of years. The cement matrix serves also as a chemical barrier which does not lose its safety functions for thousand years. • **The second engineered barrier** is a hydroisolated reinforced concrete container with thick walls, bottom slab and a lid in which the waste is placed with the remaining void space being filled with mortar forming a monolithic form. Concrete container shall allow for the retrieval of

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		waste in the period until the final closure of the NDF, which means that throughout the period of operation the container shall preserve its functional feature for transport and technological operations, including undistorted metal clamps (holds for handling) that are coated with anti-corrosion coating. According to the Technical design of the reinforced concrete container, the operational life of reinforced concrete containers for disposal (functions of isolation and retention) is calculated for the period of disposal of 300 years. Under the conditions of Radiana site, the mechanism of degradation of the reinforced concrete container is carbonation that is a slow process and determines time resistance considerably longer than 300 years. Reinforced concrete container retains its functions as a chemical barrier for thousands of years. The container is licensed by the Bulgarian Nuclear Regulatory Agency (BNRA) and is manufactured with applying of very strict testing program in accordance with the terms of the license issued by the BNRA and the Safety Standards of the International Atomic Energy Agency. • **The third engineered barrier** of the disposal facility consists of the hydroisolated disposal cells (DC) made of reinforced concrete, their foundation and closure slabs and the filling material. The safety function assigned to the DC is the retention of potential radionuclide releases from the waste packages by maintaining the cell integrity during the operation of the repository that lasts 60 years, during the repository closure, that lasts 15 years and during the whole period of institutional control that lasts 300 years. According to the Technical design of the NDF, the design life-time span of the structure of the repository is 375 years. Concrete keeps its functions as a chemical barrier for thousands of years.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		• **The fourth engineered barrier** consists of a massive loess-cement cushion with thickness of 5m on which base the repository is constructed, and the multilayer cover. Besides being a barrier against radionuclide migration, the loess cement cushion increases the thickness of the unsaturated zone and improves the overall ground conditions. The multi-layer protective cover is constructed using natural materials (clay, sand, gravel and etc.), and has a construction which ensures a lot of important safety functions, most important of which are: - Minimize as much as possible the infiltration flow of rain waters through the disposal system ensuring infiltration hydraulic flow below1.5 L/m^2 per year through the repository modules. - Serve as a barrier against external distortion of the barrier system by humans, animals or vegetation; - Provide protection against long-term erosion agents such as rainfall and wind • **The fifth (natural) barrier** is provided by the favourable site characteristics.
6	The changes that have occurred in the Kozloduy NPP area, both genetic and economic, (lack of population, types of rare diseases which lead to lack of economic activity, trade, etc.) are being monitored?	No changes are expected to occur in the vicinity of NPP Kozloduy - neither genetic, nor economic (lack of population, types of rare diseases that lead to a lack of economic activity, trade, etc.). The demographic data for the population of district Vratsa and districts of Dolj and Olt are similar in the recent years. The specificity of the natural movement of population in these areas determines the trend of aging, but depopulation of the regions is absolutely not expected.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		As Prof. M.D. A. Manolova responded to the question during the public hearing, the health status on Romanian territory and most of all – the indicators that could be affected by radiation effects (cancer, diseases of the blood and blood-forming organs and congenital malformations, deformations and chromosomal aberrations) are lower than the average for the Republic of Romania and the Republic of Bulgaria – oncological diseases and congenital malformations, deformations and chromosomal aberrations. For the period 2010-2013 in the districts of Dolj and Olt there is no evidence of deaths from diseases of the blood and blood-forming organs. With regard to the question whether Bulgaria performs monitoring of important indicators of population in the region of Kozloduy NPP, we would like to emphasize that our country is a member of the European Union with well-developed state structures, covering all aspects of demographic, economic, medical, educational and other indicators not only in the region of Kozloduy NPP, but also throughout the country. The number of the population is monitored by regular censuses, as well as yearly at municipal and district level. Systematic monitoring of all diseases is performed, including those diseases which may result in temporary or permanent disability. The register of oncological diseases in the country is publicly available (http://ghdx.healthdata.org/organizations/bulgarian-national-cancer-registry) and we would like to emphasize that by this indicator (morbidity of oncological diseases), district Vratsa is below average indicators for the country. The economic activity, agriculture, trade are subject to constant monitoring. The monitoring is done at the municipal level, the data is aggregated at district level and submitted to the National Statistical Institute, which performs statistical analysis and publishes annual handbooks with essential

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		information needed for the functioning of the state. Statistical handbooks are publicly available on the website of the National Statistical Institute, both in Bulgarian and English languages. Bulgaria like Romania, have standardized their statistics with the requirements of EUROSTAT and they are presented to EUROSTAT on annual basis. Besides the above-described monitoring, Kozloduy NPP and SERAW perform specific monitoring determined by their specific functions as an operator of nuclear units (Kozloduy NPP) and future operator of the National disposal facility. Subject of monitoring are the individual components of the environment in the 30 km zone of the KNPP (air, water, soil, flora and fauna). The EIA Report describes the monitoring programs performed by KNPP and based on the results collected throughout many years of measurements of objects of the environment, food etc. it was concluded the absence of negative environmental impacts from the operation of Kozloduy NPP. SERAW performs predisposal monitoring, that will continue in the form of operational monitoring after commissioning of the disposal facility. Based on the results of the three-years predisposal monitoring is obtained a detailed assessment of the background radiation status on Radiana site, which is the site suggested for realization of the NDF. Based on the multi barrier protection against release of radioactivity in the environment (groundwater, soil, air, etc.), envisaged in the Design and justified in the ISAR, contamination of the environment components with radioactivity as a result of the upcoming operation of the disposal facility and during the period of institutional control, is practically ruled out. The absence of emissions of radioactivity to the environment clearly proves the thesis for non-proliferation of radioactivity and the absence of any influence outside the precautionary action zone of the NDF (within the site

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		boundaries). It is absolutely clear that in this case it is unacceptable to talk about influence on the Romanian territory. It is categorically declared and proven in the EIA Report by the individual experts based on analyzes and assessments, that there are no expected impacts over environment and population outside the borders of the NDF site.
7	The bibliography used in the argumentation that you have presented.	Bibliography used to support the analysis and evaluations carried out within the assessment of environmental impact is described in detail in Chapter 8 of the EIA report.
8	In the EIA report, it is stated several times that the measured values of the environmental air, water, vegetation, soil, animal species are legal limits. This is why you concluded that it is not necessarily a cumulative impact study of all activity in the area Kozloduy nuclear facilities. Please submit an event where, attack or natural disaster extreme, highly unlikely, can occur and affect all the while nuclear units in the area.	Given that fact the investment proposal for the construction of the NDF is located near the NPP Kozloduy, the EIA Report describes the monitoring programs implemented by KNPP and the long-term results of measurements of objects of the environment, such as air, water, soil, vegetation, food, animal species are presented. The EIA Report emphasizes many times that the results show lack of negative impact over the environment as a result of the operation of KNPP. The monitoring results are not and could not be used as a justification why not to estimate the cumulative effect. They can only prove that up to now there is no negative impact over the environment as a result of the operation of KNPP and can be used as a reasonable statement, that there are no reasons that the continued operation of KNPP will result in negative environmental impacts. The cumulative effect is discussed in detail in Chapter VI of the EIA Report. We will not dwell on the examined cumulations over the components of the environment (atmospheric air, waters, subsoil, land and soils, noise, landscape and biodiversity, as well as accumulation in terms of environmental factors - non-radioactive and radioactive waste and hazardous chemical substances and mixtures because the issue is related to radiological impact on the population. It should be definitely noted that the Bulgarian nuclear legislation contains a

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		restriction on the maximum cumulative effect of all nuclear facilities on a given site. This restriction complies with the international requirements defined in the safety standard of IAEA Radiation protection and safety of radiation sources, International Basic Safety Standards, IAEA GSR Part 3 and Council Directive 96/29/Euratom of 13 May 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 – the limit of the annual effective dose for any individual of the population is 1 mSv. Based on this dose limit for all nuclear facilities on the site for the NDF is defined a value for the radiological impact on the population of maximum 0.1 mSv/year. The cumulative impact analyzed in the EIA Report is significantly lower than the regulatory limit. As described in the EIA Report, the radiological impact on the population during normal operation of the NDF is analyzed in the Interim Safety Analysis Report exclusively for external radiation as no gas and liquid emissions from the NDF in normal operation are expected.This impact is localized within the site of the NDF and practically, there is no cumulative effect on the population in the surveillance zone. The total annual dose was determined to be 18μSv (≈0.02 mSv) of direct radiation and is well below the secondary constraint (100 μSv/ year) for the NDF. For conservative assessment of the cumulative effect of exposure of the population of all radioactive releases into the environment under all operating conditions of the NPP are taken into account all nuclear facilities: - NDF on Radiana site - The operating facilities on the site of KNPP – Units 5 and 6; Spent Fuel Storage Facility, Dry Spent Fuel Storage Facility; - All activities of decommissioning of Units 1-4 (Size reduction and decontamination workshop) - Emissions from the operation of the plasma facility - New nuclear facility – maximum value for EUR limits of release. The maximum annual effective dose for the population around the KNPP,

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		including the NDF site, even in this highly conservative (practically impossible) scenario for a reference individual staying permanently on the boundary of the NDF site as a result of all radioactive emissions in the environment cumulated with all nuclear facilities on the KNPP site Units 5 and 6, Decommissioning Units 1-4, Plasma facility, new nuclear power and NDF is estimated at 20.88 μSv/ yr., which is far less than the quote of 100 μSv/yr. for NDF, 250 μSv/ yr. from exposure of radioactive releases from the nuclear power plant (Regulation on ensuring the safety of nuclear power plants (Prom. SG. 66 of 30 July 2004, last. amend. SG. issue 5 of 19 January 2010) and the limit for the population 1000 μSv/ yr. (Regulation for the basic standards of radiation protection – 2012). The obtained additional dose rate is about 100 times lower than the natural radiological background (2330 μSv). The accidents are examined in another chapter of the EIA Report as well as in the safety assessments that are subject to licensing regime by the competent authority - Bulgarian Nuclear Regulatory Agency. Safety assessments are developed based on the requirements of the national legal framework - Regulation for issuing licenses and permits for safe use of nuclear energy and the Safety standards of the International Atomic Energy Agency, which both Bulgaria and Romania are members of. Accidents which are probable to occur are examined, either due to internal or external initiators such as attack or natural disaster, and not hypothetical emergency situations that can occur on the site. In the examined potential accidents and incidents during the operation of the NDF - seismic risk, floods, extreme winds and tornadoes, human intervention - plane crash, drop of container and beyond design basis accident - a fall of large aircraft, radiological consequences are localized within the NDF site. This is because SERAW explicitly requested from the designer to develop the Design of the repository so that the precautionary action zone to be within the fence of the Radiana site. Accidents situations

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		are such that they can not affect or cause damage to nuclear facilities, which are located on the site of KNPP. Destruction of infrastructure, power loss, and similar results from extreme events do not result in emission of radioactive substances from the NDF neither in short nor in long term. The accidents considered in the EIA Report of the investment proposal for construction of a new nuclear power facility of the latest generation at the KNPP site such as falling of aircraft, explosions and fires, floods, extreme winds and tornadoes can not affect simultaneously all nuclear facilities in the area. The existing NPP Kozloduy is operated without accidents for a considerable period of time. The analyses in the report "European stress tests for nuclear power plants, 2010. National Report on Bulgaria" indicate that there are no accidents which could affect all the nuclear facilities in the area. The probability of falling of an aircraft according to the EIA Report of the new nuclear power facility is negligibly low 4.10^{-8}. And we would like to emphasize again that this event can not affect simultaneously all nuclear facilities and the probability of occurrence is significantly lower than the limit below which the events are not considered (10^{-6}). We would like to reiterate that the site where a nuclear facility is to be constructed is subject of procedure for site selection in accordance with the requirements of the national legal framework and Safety standards of the International Atomic Energy Agency and is subject to licensing by the Nuclear Regulatory Agency. The EIA Report of the NDF from year 2015 includes detailed description of the steps of the procedure and the criteria for site selection. Even in the initial stage of the procedure for site selection is analyzed the territory of the whole country and the areas with unfavorable conditions for placement of a facility for disposal of radioactive waste are excluded, which means that even at an early stage are excluded areas where extreme natural disasters could occur which to destroy one or more nuclear facilities.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
9	It is possible to find another site, located in an isolated area for both România and Bulgaria?	The question for site selection for construction of the NDF is discussed in detail in the EIA Report. The same question is asked by the Romanian Ministry of Environment, Waters and Forests with letter Reg.No 2415/GLG/27.05.2015 and there is an answer to this question. The site selection for construction of RAW disposal facility is subject of respective rules and requirements that are stipulated in detail in the nuclear legislation of the countries that develop nuclear energy as well as in the Safety standards of the International Atomic Energy Agency (IAEA). For the purposes of site selection for the NDF, State Enterprise Radioactive waste has implemented the requirements of Bulgarian legislation, the Safety Standards of IAEA and the good practices for RAW management used in the developed European countries. According to the IAEA standards, the international experience and the good practices for RAW management in the developed European countries, as well as according to the requirements in Art.25, para. 1 of the Regulation for Safe Management of Radioactive Waste the site selection process goes through four phases, which are described in details in EIAR, Chapter 1, item 1.5 Justification of the site selection, and namely: ⇒ **Phase 1: Development of concept** for disposal and planning the activities for site selection; ⇒ **Phase 2: Data collection and analysing of areas (regions)**, which includes: **a. Analysis of the areas** – analysis and evaluation of the territory of the whole country is performed, exclufind large areas with infavourable conditions for situating RAW disposal facility and establishing areas for analysis which areas are large territories with favourable geological and tectonical, geomorphological

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		(topographical), hydrogeological, engineering and geological, hydrological, climatic and other climatic characteristics. **b. Selection of prospective sites** – the potential sites which meet the criteria for situating facility for RAW disposal are localised in the areas for analysis, then the prospective sites for thorough analysis are identified. ⇒ **Phase 3: Sites characterisation** – the prospective sites are examined thouroughly and one preferred site is selected; ⇒ **Phase 4: Confirmation (approval) of the site** – examinations are performed related to approval of the preferred site. During phase 2 is analysed the territory of the whole country and 12 potential sites are localised from which there were four most prospective sites for NDF selected after multi-factoral analysis. The four sites are: Radiana, Marichin valog, Brestova padina, and Varbitsa. These sites are subject to detailed field and laboratory examinations during Phase 3 - Characterisation of the site. During the implementation of Phase 3, Varbitsa site was dropped from further examination.The sites, which are examined in details, are described in identical way in the report, presented to BNRA. A multi-factoral analysis was conducted for comparing the characteristics of the potential candidate-sites with selected criteria. The criteria are organised in 4 main groups, namely – Safety provided by the natural conditions, Impact of unfavourable processes and fenomena, Probable impact to the environment and the population, Social and economical acceptability. This way the motivated selection of the site for NDF was made, which was described in details in EIAR, Chapter 1.5, item 1.5.1.3. The comparison of the results between the various groups of criteria

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		demonstrates that Radiana site is leading, which means that it is the most favourable site for construction of the NDF. During phase 4 there were conducted the necessary examinations for verifying Radiana site for construction of NDF in compliance with the approved plan for implementation of the activity and the quality assurance programme. The results confirm the selection of Radiana site as most suitable site for construction of NDF. The selection of Radiana site for the construction of NDF was discussed in details in the EIAR.
10	There is a monitoring program of the radiations, an emergency and response Plan to the programs radiological in case of accident?	The program for radiological monitoring is described in detail in the EIA Report. Additional explanations are provided in the answers to the questions of the Romanian Ministry of Environment, Waters and Forests. In line with the requirements of the national legal framework and the Safety standards of International Atomic Energy Agency, namely Surveillance and Monitoring of Near Surface Disposal Facilities for Radioactive Waste, IAEA, SRSNo.35, 2004; Programs and Systems for Source and Environmental Radiation Monitoring, IAEA SRS No.64, 2010; Environmental and Source Monitoring for Purpose of RadiationProtection, IAEARS-G-1.8, 2005, SERAW is obliged to develop and implement radiological monitoring programs in all stages of the life cycle of a national disposal facility. This includes: (1) program for predisposal radiological monitoring covering the period before the commissioning of the disposal facility; (2) program for disposal radiological monitoring during operation of the disposal facility; (3) radiological monitoring program in the period of closure of the disposal facility; (4) radiological monitoring program after closure of the facility in the period of institutional control. These programs are subject of control of Bulgarian Nuclear Regulatory Agency and are part of the documentations to the application for a permit for commissioning, application for license for

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		operation, applications for renewal of the license for operation, application for decommissioning/ closure of the disposal facility. The radiological monitoring covers: - measurement of Radiation gamma background (measured with thermoluminescent dosimeters (TLD) and field (in situ) measurements) - measurement of specific, or volume radioactivity of key radionuclides in soils; - measurement of specific, or volume radioactivity of key radionuclides in natural waterways - the waters of Danube River; - measurement of specific, or volume radioactivity of key radionuclides in drinking water, - measurement of specific, or volume radioactivity of key radionuclides in groundwater by a system of observation wells (piezometers) for control and monitoring of the groundwaters in line with the requirements of Regulation No 8 on the conditions and requirements for construction and operation of landfills and other facilities and installations for waste disposal and recovery (2004), the recommendations of IAEA – Characterization of groundwater flow for near surface disposal facilities, IAEA-TECDOC-1199, the above quoted safety report series of IAEA, the recommendations of ASTM D 5092-04 Standard Practice for Design and Installation of Groundwater Monitoring Wells and EPA, 1995 Monitoring well design and construction for hydrogeological characterization. Guidance Manual for Groundwater investigations. - measurement of specific, or volume radioactivity of key radionuclides in sediments of the Danube River, in the places for taking water samples. - measurement of specific, or volume radioactivity of key radionuclides in atmospheric air. This includes aerosols which are sampled with air sampling devices as well as atmospheric depositions. - measurement of specific, or volume radioactivity of key radionuclides in flora. This includes plants (grass and foliage) and algae from the Danube

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		River, in the places for taking water samples. - measurement of radioactivity in food and agricultural crops. This includes meat and bones from fish from Danube river, milk from cattle raised in vicinity as well as crops from areas in close proximity to the site. Controlled parameters are ambient dose and integral ambient dose of gamma radiation, a total alpha activity, total beta and alpha activity, concentration of key alpha, beta and gamma radionuclides in the samples. According to the requirements of the Law on Safe Use of Nuclear Energy, the persons performing management of radioactive waste are obliged to take measures to prevent incidents and accidents and limit their consequences. Emergency planning measures are established in the Emergency plan, which according to the Regulation for issuing licenses and permits for safe use of nuclear energy, is developed on stage commissioning of the facility. Emergency plan for the NDF will be developed at the stage of commissioning and will meet the requirements of the Regulation on emergency planning and emergency preparedness in case of nuclear and radiation emergencies. The Emergency plan will encompass emergency situations which are identified and evaluated in the Intermediate Safety Assessment Report and are described in detail in the EIA report. In the Emergency plan will be described in detail the procedures for reporting and decision-making, the measures for analysis of the emergency situation including measures for radiation control and monitoring, as well as terms and procedures for liquidation of consequences of the accident.
11	Bulgaria should be able to diversify its sources for producing electricity (green energy, hydro, gas, coal, etc.) in a way that they are much less risky to human health, creatures and without significantly affecting the environment.	The question is outside of the scope of the EIA Report for the investment proposal for construction of the National disposal facility for disposal of low and intermediate level radioactive waste (NDF). Nevertheless we would like to emphasie that as a member of the European union, Bulgaria has diversified the sources for electricity production, taking into account all factors including the impact on the environment and

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		humans. More information can be obtained from the Energy Strategy of the Republic of Bulgaria, which is a public document available on the Internet.
	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of the Environment, Waters and Forests on the 13 July 2016.	
12	The conclusions of the seismic calculation using the Richter scale- the new seismic situation from Romania (ex. Buzau area) has to be considered	The seismic hazard assessment is based on database of earthquakes generated within the 320 km region around Kozloduy in the period from 375 up to date. This database includes more than 3200 eartquakes. It is developed on historical documents as well as the Global Instrumental Earthquake Catalogue, Catalogue of earthquakes in the Mediterranean and surrounding area, Cataloque of the Central and Southeastern Europe, several international and national cataloques, incuding the Romanian cataloques as follows: • 'Catalogue of strong earthquakes originated on the Romanian territory: Part I-before 1901, Part II – 1901-1979 (Eds. Cornea, Radu. 1979)'; • 'ROMPLUS, 2007 - Romanian Earthquake Catalogue under continuous update', In other words the seismic hazard assessment considres the whole historical and contemporary information for the seismic conditions within the 320 km region around Kozloduy including the corresponding territory of Romania.
13	The monitoring results of the radiation within a 30 km on Romania territory	Kozloduy NPP performs detailed and systematic radiological monitoring in the Bulgarian section of the surveillance zone (30 km radius) around the KNPP. The scope of monitoring is in accordance with national legislation (BNRA), in line with to the Ordinance for special-statutory areas and other regulations in the field. There is compatibility with the established international practice for radiological monitoring around sites with sources of ionizing radiation. The controlled parameters and the objects of control cover all the major components of the environment with the respective ways of receipt and impact on the environment and human. The organization and scope of

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		monitoring fully meet the requirements of the European Commission (EURATOM), Article 35 of the Euratom Treaty, Recommendations Euratom/ 2000/473 and Euratom/ 2004/2. Responsibility for radiological monitoring under the national and European legislation is for each member state - for its territory. Bulgaria rigorously implements these requirements by ensuring that quality and reliable monitoring of the Bulgarian section of the 30 km monitored area of NPP Kozloduy, with both institutional control and independent research by the control and supervisory authorities in the country. Concerning the Romanian side of the zone, Republic of Romania should have envisaged means for control and monitoring of the radiological parameters of the environment, as Bulgaria has envisaged tools for control and monitoring of radiation parameters of the environment on Bulgarian territory in the zone of influence of NPP Cernavoda. According to Article 35 of Euratom Treaty: "Each Member State shall establish the facilities necessary to carry out continuous monitoring of the level of radioactivity in the air, water and soil and to ensure compliance with the basic standards. The Commission shall have the right of access to such facilities; it may verify their operation and efficiency" In case of a declared interest from Romanian side for monitoring on Romanian territory by the responsible institutions of Republic of Bulgaria, this may be subject to future agreement between the two countries at governmental level of mutually beneficial and reciprocal basis - same measures to be taken in respect of the area around Kozloduy NPP and the area around NPP Cernavoda Such agreement is outside of the EIA procedure for the investment proposal of SERAW for the construction of the National disposal facility for

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		radioactive waste. Once again we would like to emphasize that from regulatory point of view there is no such requirement and obligation. All requirements of the legislation at national and international level are met.
	Answers to the questions of Ms. L Simoiu, president of Civic Association for Life, Craiova concerning the points for the case in SAC against the second EIA for the National Repository for Radioactive Waste (NRRW) in Bulgaria, sent by the Romanian Ministry of Environment, Waters and Forests by email on 13th of July 2016.	
14	There is a manipulation of the demographic data on population movements in the area Dolj- while in the first EIA are set 13.7% mortality in the area and 11.7% in Romania country , then in the second report there are no values, but a schedule with exactly opposite results. In this regard, the Supreme Administartive Court (SAC) in decision № 11040/22.07.2013, rejecting the first EIA emphasized absolutely the same exceeded two points of mortality for Kozloduy Municipality compared the state Bulgaria, and the court notes that the deseases of circulation take the first place. The same diseases are on the first placein the area of Dolj also, according to the first EIA which is colcealed in the second EIA.	The data on population movements in districts of Dolj and Olt as well as mortality data, which are used in the EIA Report, are from official sources - National Statistics Institute, Romania (http://statistici.insse.ro/shop/?lang=en) so that there can be no manipulation of the data. Due to lack of national data on morbidity of oncological diseases in Romania (at the time of development of the EIA Report from 2015 were available 3 regional cancer registries, one of which for children – EUREG List of Registries (http://eco.iarc. fr / eureg / LinksList.aspx), for the purposes of assessment is used data on mortality from the three groups of diseases (ICD 10) associated with the radiation factor: - Class II Neoplasms (C00-D48) Malignant neoplasms (C00-C97) – i.e. oncological diseases - Class IX Diseases of the blood, blood-forming organs and certain disorders involving the immune mechanism (D50-D89). These diseases should not be confused with diseases of the circulatory system - Class IX, as explained in the text below. - Class XVII Congenital anomalies (defects of development), deformations and chromosomal aberrations (Q00-Q99) According to the data of National Statistical Institutes of Romania (http://statistici.insse.ro/shop/?lang=en) and Bulgaria (http://www.nsi.bg/en), cancer mortality rates per 100 000 people in the

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<tr><td></td><td></td><td>districts of Dolj and Olt in the last 4 years is lower than the national average and district Vratsa:
<table>
<tr><td></td><td>2010 r</td><td>2011 r.</td><td>2012 r</td><td>2013 r.</td></tr>
<tr><td>Romania</td><td>211.2%ooo</td><td>215.5%ooo</td><td>219.0%ooo</td><td>222.4%ooo</td></tr>
<tr><td>District Dolj and Olt</td><td>198.8%ooo</td><td>193.1%ooo</td><td>208.7%ooo</td><td>206.8%ooo</td></tr>
<tr><td>District Vratsa</td><td>304.3%ooo</td><td>307.7%ooo</td><td>296.0%ooo</td><td>320.0%ooo</td></tr>
</table>
For the period 2010-2013 in the districts of Dolj and Olt there is no evidence of deaths from diseases of the blood and blood-forming organs, and mortality from congenital malformations, deformations and chromosomal aberrations is respectively 2.00%ooo, 1.09%ooo, 2.12%ooo and 1.96%ooo.

Therefore, we can conclude that the health status of the population in 30 km surveillance zone around Kozloduy NPP on the territory of Romania does not differ from that of the entire population of the country. Mortality from oncological diseases is lower than that on Bulgarian territory and the average mortality from oncological diseases for Republic of Romania. According to EUROSTAT data, it is one of the lowest in the European region for the period 2008-2010.

As a matter of fact, the leading cause of mortality in district Dolj and in district of Vratsa are cardiovascular diseases, suggesting that aging of the population, lifestyle - poor diet, overweight, bad habits (consumption of alcoholic beverages, smoking), low physical activity, lack of exercise as well</td></tr>
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	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		as stress are critical for the health status of the population. The results of official statistics show that so far there is no evidence of radiation impact on population health in the district of Vratsa and Dolj. We would like to emphasize that diseases of the circulatory system (ICD 10) are not radiation-induced diseases. These are socially significant diseases defined as Class IX Diseases of the circulatory system (I00-I99), which include the following groups of diseases: - Ischemic heart disease(I20-I25), including: acute myocardial infarction (I21-I22) and other forms of coronary artery disease (I20, I23-I25) - Other Heart disease (I30-I51) - Cerebrovascular diseases (I60-I69) (i.e. stroke) -other Diseases of the circulatory system (I00-I15, I26-I28, I70-I9) It should be also taken into consideration that the terms "morbidity" and "mortality" are different concepts. The overall mortality both for Bulgaria and for Romania, which is considered in the EIA Report, is by no means due to the presence of a nuclear power plant.
15	SAC focuses on the first EIA report stated 50 years durability of reinforced containers with radioactive waste and the same durability of containers is also mentioned in the second EIA report. Remains unanswered this motive in the SAC decision № 11040/22.07.2013, rejecting the first EIA- how this fact correlates with the announced reliability of 375 years of NRRW.	The question of durability of reinforced concrete containers (second engineering barrier of the multi-barrier protection system of the repository) is very well explained in the EIA Report as well as in the responses to questions posed by the Romanian Ministry of Environment, Waters and Forests. Regarding the alleged 50 years of durability of reinforced concrete containers we would like to categorically state that apparently this issue is not understood, the statement does not reflect reality and is not based on the information for the multi-barrier engineering protection system of the repository presented in the EIA Report. According to the Technical design of

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		the reinforced concrete containers, at least 50 years no maintenance/ repair of metal handlings (metal bearing ears) is required, which are used for operations of lifting, moving of containers and their transportation. Put another way, the minimum resource for transport and technological operations (handling with metal bearing ears) is 50 years. This period can easily be extended by implementing measures to support the bearing ears including the replacement of anticorrosion coating. The resource of reinforced concrete containers for storage (retention and isolation functions) according to its Technical design is estimated to 300 years. In terms of Radiana site, the mechanism of degradation of reinforced concrete is carbonation, which is slow process and determines duration of resistance considerably longer than 300 years. For more information regarding the reinforced concrete containers, please refer to the answer to Question 3
16	Remains unanswered the position of Bulgarian Ministry of Health that presented in the first EIA report radionuclide inventory of planned radioactive waste disposal in the NRRW besides qualified as low and intermediate level radioactive waste from category "2a", there are four long-living radionuclides (Carbon-14, Nickel-63, Niobium-94, Iodine-129). While the permited for disposal in this NRRW Cesium-137 the half-life is 30 years (which is the statutory ceiling on the half-life of buried RW), the half-life of those four pointed out by Ministry of Health Carbon-14 is 5730 years, and for Iodine-129 is 17 million years, ie availability of these lomg-living radionuclides are already a category "2b"and determine normative choice of	The assertion that in the National disposal facility will be stored long-lived radioactive waste is false. Also false and manipulative is the assertion that this is the position of the Bulgarian Ministry of Health. We categorically declare that in the National disposal facility will be disposed only radioactive waste category 2a. The legislator has clearly defined what represent the radioactive waste category 2a and the waste to be disposed in the National disposal facility meets the criteria for RAW category 2a. According to Article 6, par. 2, it.2a of the Regulation for Safe Management of Radioactive Waste: "*Category 2a – low and intermediate level waste containing mainly short-lived radionuclides (with a half-life shorter or equal to that of Cs-137) and long-lived radionuclides with considerably lower level of activity, limited for the long-lived alpha-emitters below 4.10^6 Bq/kg in a*

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
	geological type of NRRW- not to be near surface and at a certain depth located entirely underground.	*single waste package and maximum average value for all the packages in respective facility 4.10^5 Bq/kg".* The definition of the legislator shows that radioactive waste category 2a contain mostly short-lived radionuclides and small amount of long-lived radionuclides whose content is below a certain limit. Radioactive waste which will be disposed in the National disposal facility fully comply with these criteria. This is confirmed by the competent authority of the Republic of Bulgaria - Bulgarian Nuclear Regulatory Agency, which granted the Design permit of the NDF for the disposal of radioactive waste category 2a, based on the inventory of radioactive waste subject to disposal. Concerning the selection of the type of facility for disposal of radioactive waste category 2a, the legislator is also definitive. According to Article 18, item 4 of the Regulation for Safe Management of Radioactive Waste "*Radioactive waste category 2a shall be disposed in surface engineered facilities for radioactive waste disposal*." Last but not least we would like to emphasize that the Bulgarian nuclear legislation, including Regulation for Safe Management of Radioactive Waste, fully meets the Safety standards of the International Atomic Energy Agency and is harmonized with the European legislation.
17.	In the second EIA was repeated the assertion noticed by court decision № 11040/22.07.2013 on that potential radiological impact is localized to the site of the repository when this unsubstantiated allegation has already been critically challenged by the Executive	The assertion that the potential radiological impact is localized within the boundary of the site is justified in the EIA Report and the Interim Safety Analysis, which examines the potential radiological consequences for the population both during the period of operation and after closure of the repository during the institutional control. In Chapter 5 of the EIA Report as

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
	Environmental Agency in the first EIA report. That allegation is repeated again in the second EIA, this time is suppressed by the EEA.	well as in the Interim Safety Analysis are discussed both normal operation (normal evolutionary scenario) and cases of accidents (design basis accidents and beyond design basis accidents). It has been proved that in all considered scenarios the radiological consequences for the population are significantly lower than the limits imposed by competent authorities. According to the Regulation for Safe Management of Radioactive Waste maximum annual individual effective dose for the population can not exceed 0,1mSv/ yr., and the maximum annual individual effective dose for the population in case of design basis accidents scan not exceed 1 mSv/ yr. As shown in Chapter 5 of the EIA Report and in the Interim Safety Analysis, this is performed for all examined scenarios i.e. the public safety is ensured in accordance with the radiological criteria, which are underlined in the Bulgarian legislation. And as repeatedly emphasized in the EIA Report, including also in these answers to questions, the Bulgarian nuclear legislation, including Regulation for Safe Management of Radioactive Waste, fully meets the Safety standards of the International Atomic Energy Agency and is harmonized with the European legislation The EIA report explicitly emphasized that the precautionary action zone is within the boundary of the NDF site, i.e. within the fence of the disposal facility. This is because SERAW explicitly requested from the designer to design the National disposal facility in such way that the precautionary action zone to be within the boundary of site of the NDF, which is a requirement of the condition 2.31, letter "c" of Design permit of the NDF № NH-3593/ 04.05.2012. According to legislator (Article 4, par.2, it. 2 of the Regulation on emergency planning and emergency preparedness in case of nuclear and radiological emergencies), precautionary action zone is the area around the nuclear facility in which shall be taken protective measures when accident is

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		announced, i.e. the area in which is concentrated the radiological impact of any given nuclear facility. The outer boundary of the precautionary action zone is determined in accordance with Regulation on emergency planning and emergency preparedness in case of nuclear and radiological emergencies. The legislator has decreed that the maximum annual individual dose to the population in case of design basis accident at the outer border of the precautionary action zone should not exceed 1 mSv/ yr. In the Interim safety analysis is examined the decrease of the dose with the distance from the point of accident. In all considered scenarios the dose on the fence of the NDF is lower than the regulatory limit on the external border of the precautionary action zone (1 mSv/ yr.). This proves that the radiological impact of the NDF is concentrated within the NDF site.
18	SAC focuses on decision № 11040/ 22.07.2013, when assessing the first EIA that are not covered in the survey of "Mineproject" JSC standarts for the type of store with outlets for recommending the construction of "tunnel type" full depth underground, not "trench type" on the ground.	Statement is manipulative. Study performed by an organization like Mineproject JSC, which is interested in design and construction of a tunnel type repository can't be called standard and the Supreme Administrative Court has not recognized this study as a standard. Standards are regulatory documents that are part of the Bulgarian legislation, Directives of the European commission - Euratom and Safety standards of the International Atomic Energy Agency. The recommendation of a private organization, which as we said is interested in design and construction of tunnel type repository as decisive for choosing a tunnel type repository can't be accepted. Manipulative, misleading and false is the assertion that the tunnel type repository is constructed entirely underground, while trench type repository is on the surface. As described in the EIA Report, tunnel type repository is constructed at a depth of 25-30 meters below the surface of the site, while trench type repository is constructed deeper - 35 meters below the original

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		surface of the ground. After the end of the operational period of the repository, the cells of the trench type repository are covered with multilayer protective cover, restoring the original landscape of the area and thus being placed deeper than the tunnel type repository.
19	In the second EIA, the same way as in the first one, still in the assignment made by the State Enterprise "Radioactive Waste" is again destined for choosing type of store "trench type" and place of the site -"Radiana" in the territory of NPP "Kozloduy", which has seized the opportunity and the regulatory requirement that judgment to be made after a reasonable analysis by the authors of the EIA report.	The suggestion that the choice of a trench type repository is predetermined by SERAW and that the authors of the EIA Report can not compare the two technologies and based on reasoned analysis to recommend suitable technology, is manipulative and does not reflect reality. In the EIA Report, Chapter 2 „Alternatives of the proposed technology and motives for the choice made" is made comparative analysis of both technologies for disposal – trench type and tunnel type repository. The comparison is made using the following indicators: (1) Structure of the disposal facility; (2) Capacity of the disposal facility; (3) Auxiliary buildings and facilities; (4) Required area; (5) Passive systems ensuring safety; (6) Active systems ensuring safety; (7) Process of emplacement of the reinforced concrete containers in the depository; (8) System for management of infiltration; (9) Methods for control and monitoring during the period of operation; (10) Retrieval of the reinforced concrete containers during the period of operation; (11) Necessity of test facilities before construction of the facility; (12) Construction of the disposal facility; (13) Management of earth masses and humus; (14) Stages in the construction of the repository; (15) Necessity of test facilities before closure of the facility; (16) Closure of the facility; (17) Methods for control and monitoring in the period of institutional control; (18) Use of technology proven in practice. The advantage of the trench type repository is convincingly shown on compared technological indicators. Additionally in Chapter 4 „Description, analysis and assessment of the presumable significant effects on the population and environment, in radiation and non-radiation aspect, as a result of the realization of the NDF, the use of natural resources, emissions of harmful substances during normal

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		operation and emergency, waste generation and creation of discomfort" the two technologies are analyzed from the point of view of their impact onto the components and factors of the environment and the advantage of the trench type disposal technology is indicated. They are summarized in item 4.13 „Justification of the selected alternative - tunnel or trench type in terms of the impact assessment on all components and factors of the environment and the material and cultural heritage and alleged potential effects on the population in the area and the workers on the site of the investment proposal". Also false and manipulative is the assertion that the authors of the EIA report were not given the opportunity to describe and analyze the selection of Radiana site for the construction of a repository for radioactive waste disposal. The topic of site selection for the NDF is discussed in detail in the EIA Report. Concerning the procedure for site selection that follows the requirements of the nuclear legislation and the Safety standards of the International Atomic Energy Agency, please see the answer to question №9 brought above. The actual analysis and justification of selection of Radiana site for the construction of the National disposal facility for radioactive waste is carried out and described in detail in Chapter 1 of the EIA report. In item.1.5.1 „Justification for the realization of the investment proposal on Radiana site" includes detailed description and analysis of the characteristics of the compared sites – Radiana, Marichin valog and Brestova padina. The selection of Radiana site for the construction of the NDF is based on a multifactor (multi criteria) system analysis. The methodology of multi criteria system analysis is based on the Regulation for Safe Management of Radioactive Waste and the Safety standards of the International Atomic Energy Agency - Siting of Near Surface Disposal Facilities, Safety Standards Series No. 111-G-3.1 and Near Surface Disposal of Radioactive Waste, Safety

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		Standards Series No. WS-R-1. A comparison is made of the researched sites according 23 criteria, compiled in group A - Safety provided by natural conditions; group B – Effects of adverse processes and phenomena; group C – Possible environmental impacts; group D – Socio-economic acceptability. The criteria include: (1) Lithostratigraphic construction; (2) Tectonic and neo tectonic conditions; (3) Geomorphologic conditions; (4) Geotechnical conditions; (5) Geochemical characteristics; (6) Hydrogeological conditions; (7) Seismicity; (8) Exo geodynamic processes; (9) Impacts of floods; (10) Meteorological processes and phenomena; (11) Hazards of technogenic character; (12) Water and Mineral Resources; (13) Land use and land ownership; (14) Transport of RAW; (15) Population and urban network; (16) Vegetable and animal species; (17) National cultural and historical values; (18) Nuclear experience of the population and proximity to NPP; (19) Infrastructure; (20) Adverse effects on other economic activities; (21) Proximity to state boundaries; (22) Public acceptance; (23) Comparative construction costs. The methodology for evaluating sites on individual criteria is presented as an appendix to Chapter 1 of the EIA report, and the results are summarized in a comparative table, which conclusively proves that Radiana site is ranged on a first place as a preferred site that provides the best conditions for construction of a repository. The results of the made choice are confirmed by comparative analysis of the safety of the investigated sites brought in the EIA Report. In accordance with the requirements of nuclear legislation and the Safety standards of the International Atomic Energy Agency (IAEA) is made a safety analysis following the commonly agreed methodology ISAM of IAEA. The normal evolution scenario as well as the intrusion scenario associated with the settlement of people on the site are analyzed. It was convincingly demonstrated that for all the tested scenarios, the radiological consequences for the population for Radiana site are significantly lower than

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
		the maximum annual individual dose of 0,1mSv defined by the legislator with the Regulation for Safe Management of Radioactive Waste.
20	Two studies on study of potential sites for the disposal of radioactive waste in Bulgaria are neglected. The first report is under contract under program "PHARE" from 1997 authored by John Mathieson, Cassiopee; Andew Temple, AEA Technology; GerrardObin, SGN and Anton Boyadzhiev, Risk Engineering. It evaluated 20 sites on 12 criteria and the site "Radiana" is missing in this choice. The second report of the Geological Institute of the Bulgarian Academy of Sciences (BAS) from 2000, were assessed 30 sites on 28 criteria. In this report again site "Radiana" is missing. Based on these studies "Mineproject"AD, under the "PHARE" and BAS, The Board of SE "RW" has decided to build a 'tunnel type' NRRW but that decision was changed after the appointment of the current CEO of SE "RW" Mr. Dilyan Petrov. He adopted a 'trench type' repository, commissioned a new report in BAS in 2006, geologists made "new" assessment of the otherwise unchanged centuries-old geological structure in Bulgaria and gave a certain priority to the assigned site Radiana for near-surface respository. Finally we quote SAC decision № 11040/ 22.07.2013, rejecting the first EIA: "The system of measures for radiation protection involves selecting an appropriate site for the deployment of nuclear facility. The basic	The assertion that Radiana site was not among the preferred sites in the study by program PHARE from 1997 and in the study of GI-BAS from 2000, is false and manipulative. The site was known as Kozloduy NPP site (it was renamed to Radiana in 2008) and it was among the first preferred sites for construction of a National disposal facility. Regardless of preferences in terms of Kozloduy NPP site, now called Radiana site, the reason why it was chosen is not based on the limited information that was available in the 90-s of the last century until year 2000 inclusive. As described in the EIA Report, on Phase 3 - Characterization of sites on the stage of site selection, SERAW held detailed and thorough field geological, hydrogeological, geophysical, geochemical, geological, seismic, and other studies of preferred sites Radiana, Brestova padina and Marichin valog. So the selection of Radiana site is based on contemporary new scientific knowledge about the field conditions of the surveyed sites. For more information please refer to the answer to the previous question №19. The assertion that the new executive director of SERAW Mr. Dilyan Petrov "assigns the preparation of a new report to the Geological Institute in 2006, geologists make "new" assessment of the otherwise unchanged for centuries geological structure of Bulgaria and give definite priority to Radiana site for construction of a near-surface repository" represents a rootless innuendo that shows the lack of ability of the author to substantiate his thesis with scientific arguments, because as described above in the answer to the previous question №19, this is objectively impossible. Mr. Dilyan Petrov was appointed as Chief executive director in August 2010 and it is impossible for him to use his position of Executive director for the purposes of assigning a study in year 2006. Regarding the selection of technology of disposal - trench type repository, which is preferred to the

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
	critetion in the eslection should be radiological rather than economic criterion. The report says that according to the criteria of safety the best site location is "Marichin valog"… The report lacks a detailed comparative analysis and technologies with regard to the construction of the facility, which is mandatory according to Art.96, para.1 pt.2 of the Act for assessment of environmental impact". These reasoned conclusions of the court are not removed in the proposed for public comment second EIA report for the NRRW.	tunnel type repository, please see the answers to questions №18 and №19. Regarding the attempt to use the decision of the Supreme Administrative Court to the first EIA report as a suggestion, that the selection of Radiana site for construction of the NDF is not based on safety criteria, but on economic criteria, please take into consideration, as shown in the answer to Question №19, that the economic criterion is only one of the 23 criteria on which Radiana site was selected as a site for disposal of radioactive waste. The economic criterion is not only non-decisive, but is unfavorable for Radiana site, because the conditions at the site suggest significantly higher costs for construction of a repository. The selection of Radiana site as a site for construction of a repository for disposal of radioactive waste as assessed and proved in the EIA Report and described in the answer to Question №19, is based on safety criteria. Please note that during the development of the updated EIA Report from 2015, which is subject of the renewed EIA procedure, are taken into consideration all the remarks of the Supreme Administrative Court. The scope of this EIA procedure is the updated EIA Report from 2015 and not the previous Report from 2011.
21	Our proposal is the Ministry of Environment and Water (MEW) of the Republic of Bulgaria to return, without entering underway procedure for judicial review, for the third time making third EIA report, but this time to assign a new teamof experts because the second EIA report was unlawfuly assigned to the same team – whose first report was declared by the court for poor. And something more significant disabilities referred by the court of the first report are literally 'copy-paste' are	The statement of the Employer is that the proposal made, being the personal position of the author is: (1) Unlawful – the authority which controls the legality of the tender procedures in Bulgaria is the Commission for Protection of Competition and not the Ministry of Environment and Waters; (2) Ungrounded - as shown in the answers to previous questions, all the statements of this author are ungrounded, including also the assertion

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	Standpoint and motives of the Employer State Enterprise Radioactive Waste
	placed in the second report. Applied by SE "RW"category "unforeseeable circumstances" of the Public Procurement Act and the notification of the Ministry of the Romanian Ministry of Enviroment and Forests that the report was returned by the court due to 'technical flaws'- do not correspond to the truth, as stated in above only part of the essential notes of SAC in decision № 11040/ 22.07.2013, confirmed by the second and third instances of the same court.	for „copy-paste", which is not justified. The citations of the decision of Supreme administrative court, made by the author are relevant to the previous EIA Report and do not refer to this Report, which is subject of renewed EIA procedure.
22	We would like to hope that in the third EIA report: 1. Purpose of the NRRW to add that type of waste – except '2a'and part of long-lived category '2b'; 2, Review the use of containers with a short life of 50 years; 3. The site be moved from the site "Radiana" (sand-clay strata) to a stable geological structure allowing deep construction; 4. Type of construction of the NRRW to restore the previous choice of SE"RW" for 'tunnel type'- located entirely below ground, not on the surface.	The statement of the Employer is that the suggestions made by the author are wishful. The statement of the Employer is these wishful proposals are contrary to the regulatory requirements in the field of nuclear legislation as well as contrary to the updated National strategy for management of spent nuclear fuel and radioactive waste.
	Answers to questions of Ms. L Simoiu, president of Civic Association for Life, Craiova concerning part of the written notices from 15.02.2016 to a second instance / five-member panel - case №14214 / 2015/ of the Supreme Administrative Court (judgment has already come out to confirm the decision at first instance to reject the appeal) by Peter Penchev	
23	Part of the written notices from 15.02.2016 to a second instance / five-member panel – case №14214/2015/ of the Supreme administrative court (judgment has already come out to confirm the decision at first instance to	The written notices of Mr. Peter Penchev concern another procedure – the extension of operational lifetime of Units 5 and 6 of KNPP. They are out of the scope of the EIA of the investment proposal for construction of the National disposal facility for low and intermediate level radioactive waste.

	Questions, proposals, suggestions, opinions and objections sent by the Romanian Ministry of Environment, Waters and Forests after the public hearing	**Standpoint and motives of the Employer State Enterprise Radioactive Waste**
	reject the appeal) by Peter Penchev	