

ENVIRONMENTAL AGREEMENT

Pursuant to the application submitted by National Company “Nuclearelectrica” S.A. based in Bucharest, str. Polonă nr. 65, sector 1, registered with the Environmental Protection Agency Constanta under No. 6548 RP/09.08.2006 and with the Ministry of the Environment and Water Management under No.109.977/24.08.2006, and the subsequent amendments submitted in the regulatory process, based on Emergency Government Ordinance No.195/2005 on environmental protection, as approved and amended by Law No.265/2006, as amended, of Law No. 111/1996 on the safe deployment, regulation, authorisation and control of nuclear activities, republished as amended, and of Government Decision No. 48/2013 on the organisation and operation of the Ministry of Environment and Climate Change and amending certain regulations in the area of the environment and climate change we hereby issue:

THE ENVIRONMENTAL AGREEMENT

for the project: **Continued construction works and completion of Units 3 and 4 of Cernavodă NPP** str. Medgidiei nr.2, Cernavodă, Constanța County

in order to: establish the environmental conditions and measures to be complied with in implementing the investment project

providing the implementation of the following main categories of works:

- Construction Works: excavations works inside Unit 3 and 4 area; repairs on floors, walls, elements of the internal building structure, equipment foundations; concrete pouring for new structural elements; metal structure assembly works; paint, protection and epoxy lining application works on structural elements; diverse architectural works.
- Equipment and pipework assembly works: placing on foundations any equipment still not assembled; mounting pipe brackets by welding onto plates embedded in the

structures or fastening with self-drilling anchors; mounting of various interior metal structural supports for the pipework; mounting of pipework and shut-off valves and adjustment by welding; mounting of ventilation tubes and equipment, mounting of hoisting equipment; completion of pipe installation and connections to external utilities.

- Electrical and automation installation works: mounting of transformers and distribution panels; mounting of racks and cable racing; mounting of local measurement and control devices and connections for remote transmission; mounting electrical distribution and control panels; mounting process computers, main and secondary control rooms; connections to the national grid from the outlet of the power generator (busbar trunking) to the 400 kV substation.

- Cleaning works, washing the process circuits and performing hydraulic tests thereof.

- Operating and commissioning (P.I.F.) tests

I. Description of the project, works provided for the project, including plants and equipment

1. General

The site of the Cernavoda NPP was initially designed to host five CANDU 600 reactors, each estimated for gross installed output of 700 MW. Construction started simultaneously on the 5 units, but the strategy was changed in the early 1990s allowing for the units to be completed one by one. Units 1 and 2 started commercial operations as follows: Unit 1 in 1996 and Unit 2 in 2007; the other nuclear units left in conservation at the time.

The Project “Continuation of construction works and completion of Units 3 and 4 of Cernavoda NPP” means the continuation of the previously started works , the state of completion being as follows:

- for Unit 3 (U3), the civil construction works on both NSP (Nuclear Steam Plant) and BOP (Balance of Plant) have been 52% completed and the hydrotechnical, water supply and sewerage works 49% completed;
- for Unit 4 (U4), the civil construction works have been 15% completed.

The technology used is CANDU(Canadian Deuterium Uranium) 600 – PHWR. It's a Canadian-designed power reactor of PHWR type (Pressurized Heavy Water Reactor) that uses heavy water (deuterium oxide) for moderator and coolant, and natural uranium for fuel.

2. Main buildings, systems and equipment in Units 3 and 4

Units 3 and 4 each include the following main buildings:

- Reactor building;
- Auxiliary Nuclear Service Building;
- Turbine Building;
- Emergency Power System Building and Secondary Control Area;
- Standby Diesels Generators Building;
- (D₂O) Heavy water upgrading tower and main stack;
- High Pressure Emergency Core Cooling Building;
- Spent fuel Bay, including fuel transfer preparation area;
- Main output transformer building;
- Building of the Emergency Filtered Containment System;
- Building of the Emergency Water Supply System;
- Administrative building.

The main systems serving each of Units 3 and 4 and their main functions and/or characteristics include:

The Reactor Assembly: the reactor comprises a stainless steel horizontal cylinder calandria vessel, closed at each end by end shield, which support the horizontal fuel channels that span the calandria, and provide personnel shielding. The calandria is housed in and supported by a light water-filled, steel lined concrete structure (the reactor vault), which provides radiation shielding and cooling. Calandria contains heavy water (D₂O) moderator at low temperature and pressure, reactivity control mechanisms, and 380 fuel channels.

The Primary Heat Transfer System is designed to circulate pressurized heavy water coolant (D₂O) through the reactor fuel channels, in order to remove heat produced by fission in the uranium fuel. The heat is carried by the reactor coolant to the steam generators, where it is transferred to light water to produce steam.

The Moderator System is a closed loop circuit containing heavy water at low temperature and pressure. Neutrons produced by nuclear fission are moderated (slowed) by D₂O in the calandria. The heavy water in the calandria functions also as a heat sink.

The Secondary Heat Transfer System. The steam generators transfer heat from heavy water reactor coolant to light water (H₂O) to form steam, which drives the turbine generator. The low pressure steam exhausted by low pressure turbine is condensed in the condensers by a flow of condenser cooling water. The feedwater system processes condensed steam from the condensers and returns it to the steam generators via pumps and a series of heaters. The cooling water The condenser is cooled with water coming from the Danube-Black Sea Canal.

Turbo-Generator System: the steam produced in the steam generators transfers the heat to a steam turbine that converts heat into mechanical work and than into electrical energy through a generator. The turbine set is of the condensation type and consists of one high pressure turbine and three low pressure turbines, discharging the steam into a vacuumised condenser in order to obtain maximum thermal efficiency. The synchronous type power generator supplies medium voltage alternative current.

The electrical systems independently and redundantly ensure availability of supply to the in-house consumers, in normal as well as in abnormal operation. Backup or failure supply to the nuclear safety systems is provided from the standby Diesel generators and the Emergency Power Supply system, respectively.

The special nuclear safety systems assures the safety of the personnel, of the population and of the environment.

The nuclear safety systems do not have an active role during normal plant operation;

they are only required to operate in case of abnormal operation of some components. Each of Units 3 and 4 is provided with the following independent, special nuclear safety systems: Shut Down System # 1, Shut Down System # 2, Emergency Core Cooling System and the containment;

The design of Units 3 and 4 includes the following measures aimed to improve plant response in case of severe accident, measures deriving from “stress test” -type assessments requested by the European Council and the European Commission and approved by the National Commission for Nuclear Activities Control:

- an Emergency Filtered Containment System: a system required to maintain the pressure inside the containment at reasonable level in order to not affect the containment integrity;
- Mounting of Passive Autocatalytic Recombinators within the containment to reduce hydrogen buildup after design base accidents and/or severe accidents;
- Seismic qualification of Class I and II batteries for the supply of essential consumers after a design base earthquake;
- Improved pressure discharge capacity for the reactor vault, required for residual heat removal, in order to maintain vault integrity during a severe accident;
- Water make-up in the reactor vault to provide continuous cooling of the vault in case of severe accident;
- Ensuring availability of mobile equipment (Diesel generators, pumps) as required for response after major floods or earthquakes;
- Ensuring a cooling line with fire water, seismically qualified, for the spent fuel bay, to provide an additional source of water in case of severe accident

The design base earthquake for Units 3 and 4 is defined by the peak land acceleration of $= 0.306 \text{ g}$.

3. Common objectives of Units 1, 2, 3, and 4

NPP Cernavoda site contains completed facilities currently serving Units 1 and 2 and designed to serve Units 3 and 4 as well, after certain connection works:

- The Pump House; the design shall provide for the assembly of the necessary operating equipment;
- The start-up heating plant; an additional source of steam for nuclear unit start up or outage situations;
- Chemical Water Treatment Plant;
- The 110 kV station; the design shall provide for the assembly of the necessary operating equipment for U3 and U4;
- Fire station and fire water pumps house;
- Deep water wells;
- Interim Spent Fuel Storage Facility (DICA);
- Interim radioactive waste Storage Facility;
- Alternative Emergency Control Centre;
- Environmental Control Laboratory;
- The cooling water intake and discharge canals;
- Administrative Buildings.

The shared facilities of Units U1-U4 are included in the Annex to Government Decision No.1515/2008 on issuing the environmental permit for "Nuclearelectrica" National Company - S.A. - NPP Branch - Unit No. 1 and Unit No. 2 of Nuclear Power Plant Cernavodă.

4. Other aspects required for the organisation of the NPP site in the area of Units 3 and 4

The Cernavodă NPP site design provides for underground pipelines for water supply, domestic and storm water sewerage, electrical cable systems, fuel tanks for the emergency and stand-by Diesels.

Pedestrian and vehicle access to the site was sized to allow freight, equipment and personnel circulation as required for the operations, as well as for fire response and medical intervention traffic.

The controlled area of the Cernavodă NPP site for Units 3 and 4 will be defined by a physical protection system similar to the existing one for U1 and U2.

The construction site logistics will include temporary facilities as required for the Contractor's personnel and the handling of construction equipment and materials, arranged in controlled conditions as approved based on similar procedures as those applied for Units 1 and 2.

5. Production Processes (during Operations)

5.1 Process Description

Unit U3 (similar to U4) will produce electrical power from nuclear power by successive transformation of fission energy into thermal energy in the nuclear reactor, of thermal energy into mechanical energy in the steam turbine and of mechanical energy into electrical energy in the electrical generator. The plant turbo-generator supplies electrical power at 700 MWe using the steam produced by the energy developing in the CANDU-type nuclear reactor.

Along the string of transformations that occur in the electricity production process, there are closed systems using heavy water and demineralised water, respectively, as thermal agent (the primary heat transport system, the moderator system, the condensate/feed water system, the recirculated cooling water system) and two open systems using water from the Danube (circulation cooling water system and raw service water system).

The initial fuel load will be produced by “Nuclearelectrica” National Company S.A. – “Nuclear Fuel Plant” Pitești Branch, according to the provisions of Government Decision No. 643/2007 on approving the Strategy of investor selection in completing Units NPP Cernavoda and of Government Decision No. 691/2008 on amending the annex to Government Decision No. 643/2007 on approving the Strategy of investor selection in completing Units NPP Cernavoda.

The hazardous raw materials, inputs, substances/mixtures etc. used in the process include: uranium dioxide (UO_2), (U), heavy water (D_2O), hydrogen, helium, nitrogen,

oxygen, acetylene, carbide (CaC₂), morpholine, cyclohexylamine (alternative to morpholine), hydrazine hydrate, sodium nitrite (Flomat 537/ RGCC-100), lithium hydroxide, sodium hydroxide, hydrochloric acid, ferric chloride, lime, Biocide MB-40.

5.2 Water supply and sewerage systems; pollution control installations

Some of the hydrotechnical, water supply and sewerage works associated to Units 3 and 4 have already been completed. They were implemented at the same time as Unit 1, and include: the water intake and supply channel, as well as the distribution bay.

The source of cooling water for the cooling water systems (circulation and raw service water) is the Old Danube Arm, which, downstream of the Bala branch, takes up only 15-20% of the Danube flow rate recorded at Silistra during low water periods.

water flow is abstracted from the Danube at the entrance to the Danube-Black Sea Canal, transferred along the Danube-Black Sea Canal race I and the by-pass channel and reaches the Cernavodă NPP units via special hydrotechnical works.

Water Management works proposed for this Project includes:

- The Circulation Cooling Water System;
- The Raw Service Water System;
- The Fire Water System;
- The Emergency Water System;
- The Drinking Water Distribution System;
- Sewerage for storm water, process wastewater and water drained from the water table associated to U3 and U4;
- Discharge water tunnel into the Danube;
- The chemical water treatment plant; the design provides for the extension of filtration lines, as the other component systems have already been installed for the operation of Units 1 and 2;
- Management of liquid RAW (radioactive waste);
- Domestic sewerage.

Process (industrial) water will be supplied from the Danube River, Race I of the Danube-Black Sea Canal via the by-pass channel.

The necessary operational flow rates for Units 3 and 4 are: $Q_{d \max} = 9,331,200$ cm/d (108 cm/s) and $Q_{d \text{ av}} = 6,863,616$ cm/d (79.440 cm/s).

The Circulation Cooling Water System is an open circuit, where the water supply to each nuclear unit of Cernavodă NPP is provided by a set of 4 pumps. The source of water is the Danube River, water abstracted from the Danube-Black Sea Canal Race I – bypass channel – supply channel – distribution tank.

The Raw Service Water System is an open circuit of cooling water, fed from the distribution bay via the relevant pumps in the Pump House. Filtered bulk water is distributed to the Service Building and the Turbine Building, where it cools the following equipment: heat exchangers for the recirculated cooling water, coolers of the turbine bearings oil, chilled water production plant, auxiliary steam condensers, cooling water tanks for the stand-by Diesel sets.

The Drinking Water System consisting of: groundwater source (3 very deep wells of H=700 m); - drinking water supply system of Cernavodă Town; pump station; drinking water system on the NPP site with drinking water tanks (V=1000 cm.);

The drainage systems on site required for the optimum operation of units U3, and U4, respectively, include:

- Exterior drainage around the nuclear buildings in the screened area associated to U3, and U4, respectively;
- Drainage around the Ancillary Nuclear Service Building;
- Drainage around the spent fuel bay;
- Drainage for the reactor building underwater ; associated to U3 and U4 respectively;

The fire extinguishing water supply system uses the Danube as a source of fire water, abstracting it either directly from the by-pass channel or downstream of the rotary screens in the service process water system. The fire water system consists of 2 above-

ground tanks of $V=1500$ cm each, a pumping station, the fire water top-up pumping station, fire water networks, automated fire extinguishers.

The emergency water system is an alternative cooling water source in case of events that may cause the loss of the normal heat removal systems. The cooling agent is Danube water abstracted from the distribution bay.

Wastewater Collection and Discharge

Non-radioactive wastewaters originates from the following sources: inactive drainage systems, steam generator purge, hot water from the condensers, raw service water, domestic sewerage, storm water sewerage system, groundwater drainage system, chemical water treatment plant (sludge from the clarifiers, neutralised water from neutralisation tanks, wash water from the mechanical filters).

The domestic sewerage system collects domestic wastewaters from the BOP, from the Service Building of the 2 nuclear units and from the Administrative Building of Units 3 and 4. Domestic wastewaters are transferred gravitationally to the domestic wastewater pumping station, located between units U3 and U4, and hence to the “Valea Cişmelei” Cernavodă municipal pumping station to be handled in the WWTP of Cernavodă Town.

Storm water sewerage provides the discharge for the storm waters, for waters from the mechanical (sand) filter washing from the Chemical Water Treatment Plant, from the groundwater inside the protective screen surrounding the nuclear buildings, for the wastewaters from the heavy fuel oil separator, inactive drainage systems in the Turbine Building and the syphoning basin (Diesel Building and Chillers Building), for the drainage of water accumulated in the basement of the Service building below the foundation plate.

The water collected in the storm water sewerage system discharges into the distribution bay of Cernavodă NPP.

Discharge of cooling water from the 4 nuclear units into the Danube is done through the cooling water discharge tunnel consisting of boxes, tunnels, a concrete open

channel and an earth channel discharging into the Danube. The circuit dimensions are designed to provide discharge at a flow rate of 200 cm/s in the concrete channel.

Circulation water and raw service water from U3 and U4 are discharged into the Danube or in Race II of the Danube-Black Sea Canal (in special situations). The hot circulation and service water discharge flows from one nuclear unit is 53.8 cm/s.

Wastewater Pre-Treatment facilities include:

- heavy fuel oil separator for process wastewaters from the heavy fuel oil management facility and storm waters from the oil and fuel tank sumps/tubs;
- storm water grit separator;
- neutralisation system for the waters generated in the regeneration process, equipment and floor washing in the Chemical Water Treatment Plant.

The liquid RAW system collects the active liquid effluents also providing storage, sampling, decontamination (if necessary) and controlled discharge of radioactive liquid waste from the operation of the process systems in the NSP area, and from maintenance, revision, repair and decontamination activities.

Liquid RAW is collected in epoxy lined concrete tanks every nuclear unit, inside the Service Building. When a tank is filled, the gamma activity and tritium content are measured.

If necessary, decontamination is provided in the liquid RAW treatment plant, and after decontamination the waters are discharged into the emissary water.

The activity of liquid RAW effluents is measured by the Radioactive Liquid Effluent Monitor. The Radioactive Liquid Effluent Monitor is located in the basement of the Service Building. It determines the quantity of gamma radiation emitting radionuclides, tritium and C-14 in the effluents.

5.3 Emission Sources and Atmospheric Air Protection Installations

a) Non-radioactive emission sources

The activities that generate air emissions during construction site organisation and construction works are construction and assembly of equipment and pipelines, electrical

and automation installations, and some road repair works as necessary, including emissions from transport thereof.

The machinery used (trucks, cranes, loading – hosting machinery, compressors, concrete mixers, bulldozers, etc.) operate with Diesel-type engines and release insignificant amounts of pollutants into the ambient air, so that the impact on air quality is insignificant, provided they all work at design parameters.

Fugitive emissions may also occur during the construction period, from welding activities in enclosed spaces, finishing and building painting operations. Removal of such fugitive emissions is done by retention and ventilation.

Non-radioactive air from the Service Building and the Turbine Building is taken by the non-contaminated air exhaust system and Turbine Building ventilation system respectively and discharged directly into the atmosphere. Air from the Reactor Building (considered potentially radioactive) is taken by the Reactor Building ventilation system and the heavy water vapour recovery system, filtered and discharged in a controlled manner through the dispersion stack.

Other potential non-radioactive emission sources not controlled in the plant ventilation systems include: steam from the steam pipe vents and the safety valves only releasing steam into the ambient air in abnormal operating conditions, and vapour releases from the Diesel-type generators, oil storage tanks and the sewerage system of the water treatment plant.

Non-radioactive pollutant sources of units 3 and 4 of Cernavodă NPP are the sources using fuels (light fuel oil, diesel) as follows: The start-up heating plant, the stand-by Diesels and the emergency Diesels.

The start-up heating plant is designed to provide the necessary heat source to start the units from cold shutdown state. It is in stand-by mode and only used when starting a nuclear unit. Once completed, Units 3 and 4 may also be started using the necessary steam from Units 1 or 2 when in operation, without calling on the steam from operating the Start-up Heating Plant.

The Start-up Heating Plant will only be operated for starting the nuclear units from cold state and may also provide heating to the administrative buildings if required.

The liquid fuel necessary for the operation of the Start-up Heating Plant is stored in a facility consisting of 2 above-ground metal tanks ($2 \times 1000 \text{ m}^3$) for heavy fuel oil and a 100 m^3 buffer tank for diesel.

b) Sources of radioactive gaseous effluents include the Reactor Building, the spent fuel bay, the decontamination centre and the heavy water management facility.

Radioactive gaseous effluents from the operation of a nuclear plant contain noble gases, particulate matter, iodine, tritium, C-14.

Radioactive gaseous effluents are collected in the plant ventilation systems which also provide air circulation from the low potential contamination areas to the high potential contamination areas. Subsequently, they are subject to a filtering process followed by controlled discharge through a dispersion stack of height $H = 50.3 \text{ m}$ and inner diameter $d = 2.3 \text{ m}$.

Radioactive gaseous effluents are controlled by:

a) filtration systems mounted on the discharge pipes of the ventilation systems as follows:

- one three-stage filtering unit (retaining the radioactive particles and radioactive iodine) mounted on the discharge of the Reactor Building ventilation system .

- one three-stage filtering unit (retaining the radioactive particles and radioactive iodine) mounted on the discharge of the Spent Fuel Bay ventilation system .

- one filtering unit (retaining the radioactive particles) mounted on the discharge of the Service Building contaminated exhaust system .

b) the heavy water vapour recovery system which, through a dryer system, retains tritium out of the atmosphere of the Reactor Building, thus helping cut down plant emissions as well.

c) monitoring systems for the radioactive gaseous effluents:

- Radioactive Gaseous Effluent Monitor; measures the activity of the gas effluent before discharge through the dispersion stack.
 - heavy water in air monitoring system , located on the dispersion stack.
 - activity detectors located in the Reactor Building as follows: one set on the discharge pipe of the ventilation system and another on the discharge pipe of the heavy water vapour recovery system.
- d) automated containment isolation system located in the Reactor Building; necessary to detect radioactive emissions at levels above the trigger threshold.

5.4 Operational Waste Generated in Nuclear Units U3 and U4

5.4.1. Non-radioactive waste

The main types of non-radioactive hazardous/non-hazardous waste estimated to result from the operations of unit U3, and U4, respectively, and the corresponding code numbers assigned under Law No.211/2011 on the regime of waste are as follows: lubricating oil (13 02 05*); emulsion (water + oil+sludge) (13 01 05*); solvents (14 06 03*); hydraulic fluid (13 01 11*); battery electrolyte (16 06 06*); ethylene-glycol (16 01 14*); biological sample containers (20 01 39*); batteries and car batteries (16 06 01*); absorbent materials (18 02 03); washing solutions (11 01 12); scrap tires (16 01 03); organic content waste materials (16 03 06*); glass(20 01 02); wood (20 01 38); iron (17 04 05); copper (17 04 01); paper (20 01 01); municipal and similar waste (20 03 99).

Fluid or solid hazardous non-radiation waste include lead batteries, oils, solvents, biological samples, glycol, flammable solvents, biological sample containers, emulsions, etc.

5.4.2. Radioactive waste

The main types of radioactive waste generated in the operations of Units 3 and 4 include: spent fuel, spent resins, used filters and filter cartridges, screens from the collection sumps (in the active drainage system), activated carbon filters, medium activity solid waste (from the components of systems on the nuclear side), low activity solid waste (from routine plant operations).

5.5 Hazardous Substances and Mixtures

The main hazardous substances and mixtures required in the operating processes of Units 3 and 4 include: ammoniac 25%, cyclohexamine, sodium nitrite, sodium nitrate, biocide MB-40, ethylene glycol, hydroquinone, sodium hypochlorite, citric acid, activated carbon, lithium hydroxide, gadolinium nitrate hexahydrate min.99.9%, boric anhydride, renex 36.

Units 3 and 4 of Cernavodă NPP use hazardous substances/mixtures regulated under EC Regulation No. 1907/2006 of the European Parliament regarding the registration, evaluation, registration and restriction of chemicals (REACH), as amended.

Activities associated to Units 3 and 4 do not involve the use of organochlorine organic compounds containing polychlorinated biphenyls (PCB).

6. Project Screening in Relation to Natural Protected Areas

The cooling water discharge channel is located as follows in relation to the Natura 2000 sites of the Cernavodă-Hârșova sector of the Danube:

- Natura 2000 site ROSCI0022 Canaralele Dunării: includes about 700 m of the downstream side of the earth channel, at the mouth of which the cooling waters discharge into the Danube.
- Natura 2000 site ROSPA0002 Allah-Bair – Capidava: the southern boundary of the site is about 6.5 km downstream of the cooling water discharge into the Danube.
- Natura 2000 site ROSPA0017 Canaralele de la Hârșova: the southern boundary of the site is more than 33 km downstream of the cooling water discharge into the Danube.

1. Site of Community Importance ROSCI0022 Canaralele Dunării covers a total 25.943 ha and includes predominantly forest, aquatic and semi-aquatic ecosystems, followed by grassland and anthropic ecosystems.

The Adequate Assessment Study identified that the plume of modified temperature in the Danube water may influence about 2.16% of the aquatic ecosystems in an area about 3.5 km long and about 350m wide of the Danube sector, an area

between the confluence of the cooling water discharge channel and the area near Seimeni village.

Natura 2000 standard forms, for the sites located in the Project impact area, contain the following information in regard to the conservation object: Natura 2000 site ROSCI0022 Canaralele Dunării was designated an integral part of the Natura 2000 network for the protection of the following conservation objectives: 15 types de natural habitats of community importance, of which 3 habitats of priority conservation interest; 23 wild flora and fauna species (other than birds) protected under Annex II of Council Directive 92/43/CEE, as well as one mammal species, 4 amphibian and reptile species, 15 species of fish, one invertebrate species and 2 plant species. Apart from these species, the standard form for Natura 2000 site ROSCI0022 Canaralele Dunării also lists 15 important species of plants and animals that documented the designation of the site. Also, the site overlaps with other natural protected areas, i.e.: Natura 2000 site ROSPA0039 Dunăre-Ostroave (protected for 39 species listed in Annex I of the Birds Directive and a further 10 regular migration bird species not listed in Annex 1 of the Birds Directive) and protected areas of national interest: Neo-Jurassic Reef at Topalu – code 2.352., Fossil-bearing bed at Seimenii Mari – code 2.355. and Fossil-bearing bed at Cernavodă – code 2.354., designated under Law No.5/2000 on approving the National Land Use Development Plan – Section III - protected areas.

2. Natura 2000 site ROSPA0002 Allah Bair-Capidava covering 11,645 ha was included in the European network of natural protected areas Natura 2000 for the protection of 43 wild species of birds of conservation interest listed in Annex I of the Birds Directive and 37 species of regular migration birds not listed in Annex I of the Birds Directive. This site overlaps with the natural protected area of national interest Dealul Allah Bair, covering 10 ha, declared under 5/2000 on the approval of the National Land Use Development Plan – Section III - Protected Areas. The Project for Units 3 and 4 does not cover areas of the ROSPA0002 site Allah Bair-Capidava.

3. Natura 2000 site ROSPA0017 Hârșova covering 7,406 ha was designated as an integral part of the European network of natural protected areas Natura 2000 for the protection of 39 wild species of birds of conservation interest listed in Annex I of the Birds Directive and another 32 species of regular migration birds not listed in Annex I of the Birds Directive.

The Project for Units 3 and 4 does not cover areas of the ROSPA0017 site Hârșova.

There are no priority species and habitats documented in the designation of the Natura 2000 sites ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava și ROSPA0017 Canaralele de la Hârșova, as listed in the Standard Forms for Natura 2000 and Emergency Government Ordinance No. 57/2007 on the regime of protected areas, the conservation of natural habitats, wild flora and fauna as amended, approved under Law no. 49/2011 near the Project for Units 3 and 4 of Cernavodă NPP .

II. Reasons and considerations in issuing the Environmental Agreement , considering the conclusions and recommendations of the Environmental Impact Assessment Report, of the Adequate Assessment Study and public participation

The environmental impact assessment procedure for this project was developed under the following provisions:

- art. 46 para (3) of Emergency Government Ordinance No. 195/2005 on environmental protection, as amended by Law no.265/2006, amended.
- Government Decision No. 918/2002 on establishing the framework environmental impact assessment procedure and approving the list of public and private projects subject to this procedure as amended, Annex 1 point 3.2 (in force from the date the Environmental Agreement was applied for, August 2006 and until 24.11.2006).
- Government Decision No. 1213/2006 on establishing the framework environmental impact assessment procedure for certain public or private projects (in force from 24.11.2006 and until 1.09.2009).

- Government Decision No. 445/2009 on assessing the environmental impact of certain public and private projects, as amended, Annex 1, point 22.
- Order of the Minister of Waters and Environmental Protection No. 860/2002 on the framework environmental impact assessment procedure and issuance of an Environmental Agreement, as amended (in force at the date the Environmental Agreement was applied for, in August 2006 and until 27.04.2010).
- Joint Ministerial Order of the Minister of the Environment and Forests No.135/2010, Minister of Administration and Internal Affairs No.76/2010, Minister of Agriculture and Rural Development No.84/2010 and Minister of Regional Development and Tourism No.1284/2010.
- Convention on cross-border Environmental Impact Assessment (Espoo Convention) ratified by Law No.22/2001, Annex 1 “point 2. Thermopower plants and other combustion plants of output equal to or greater than 300 MW and nuclear power plants and other nuclear reactors (except for research facilities for the production and conversion of fissionable and fertile materials of maximum output not exceeding 1 kW continuous thermal load)”.
- Emergency Government Ordinance No. 57/2007 on the regime of protected natural areas, the conservation of natural habitats and wild flora and fauna, as amended by Law No.49/2011.
- Order of the Minister of the Environment and Forests No. 19/2010 on approving the Methodological Guidelines for the Appropriate Assessment of the potential impacts of plans and programs on the natural protected areas of community interest

Based on the results and conclusions of the Environmental Impact Assessment Report, of the additional documents submitted by the Project Owner during 2006-2013 and the conclusions expressed in the final opinions of the states potentially affected by the Project, it may be stated that the potential impacts of the operation of Units 3 and 4 and the cumulated impact of the operation of all 4 nuclear

units on every environmental element were identified and assessed and no significant negative impact was identified for normal operation.

The additional thermal input contributed by the discharge of Cernavodă NPP effluent into the Danube causes the development of an altered temperature water plume. It is estimated that the effect of the thermal gradient of the Cernavodă NPP effluent will not cause a significant impact if the operation of Units 3 and 4 comply with the conditions set forth in Water Management Endorsement No.54/2013 on “Continuing construction and completing the works on Units 3 and 4 of Cernavodă NPP” issued by the National Administration “Romanian Waters” renewing Water Management Endorsement No.35/2011 for “Nuclear Plant Cernavodă Units 3 and 4”, Constanța County. These conditions provide that the discharge temperature should be a maximum 10⁰ C above the river water temperature, but no higher than 35⁰ C, after crossing the mixing area.

No significant negative impact was identified on the evolution of flora and fauna in the project impact area due to the discharge of process water into the Danube

Measures for the prevention/mitigation of potential negative impacts on the environment and the necessary conditions for normal operation at operational capacity have been included as provided by the legislation in force.

These measures and conditions are reflected in this Environmental Agreement, in the appropriate sections.

Operating procedures, response measures for the personnel of the nuclear plant and of other responsible authorities are provided for accident conditions.

The results and conclusions of the adequate assessment of the environmental impact presents the assessment of impacts on protected species and habitats, including those of community interest in the Project impact area, i.e. Natura 2000 sites ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava and ROSPA0017 Canaralele de la Hârșova. The analysis also considers significant aspects of the potential impact on biodiversity in the natural protected areas included in or overlapping with

these Natura 2000 sites. The appropriate assessment study estimated that the operation of Units 3 and 4 will not significantly impact on :

- the habitats and wildlife of community interest underpinning the designation do Natura 2000 site ROSCI0022 Canaralele Dunării and of the natural protected areas it includes;
- the bird species that for the object of protection of Natura 2000 site ROSPA0002 Allah Bair-Capidava;
- the species of wild birds the conservation of which determined the designation of special protection area ROSPA0017 Canaralele de la Hârșova.

In regard to allochthonous species, the presence of the invasive species *Corbicula fluminea* (Phylum Mollusca) was identified upstream and downstream of the cooling water discharge channel of Cernavodă NPP, as well as in the discharge channel, but no negative effect of its presence on native clam species was found; these species occupy similar spatial niches, living together.

The Adequate assessment study conclusions show that the impact of the Project for Units 3 and 4 would be insignificant, and the parallel operation of all 4 units on the Cernavodă NPP site will not affect the good conservation status of the habitats and species, including of community interest ones.

It also estimated that the operation of Units 3 and 4 will not cause a significant impact on the natural habitats and wildlife species in the Project impact area, directly or indirectly, either in the short or long term, in the construction, operations and decommissioning stages, not even cumulated with the impact of other activities conducted on the site of Cernavodă NPP.

In the context of predicted long term climate change in Romania, the Dobrogea region, corroborated with the general insignificant environmental impact assessed for the operation of Unit 3 and 4, it is estimated that the effect of the hot NPP effluent discharge into the Danube for the 4 nuclear units together will not generate negative effects on the species and habitats of conservation interest, and the impact is assessed as insignificant.

Criteria in selecting the technological and siting alternative

In building the scenarios for the analysis of Units 3 and 4 siting efficiency, consideration was given to developing a basic scenario for the basic assumption, starting from the trend of power demand in Romania. 4 alternatives were studied. The potential development of this scenario was based on the Strategy for Increasing Energy Efficiency in Romania and the “Energy Roadmap for Romania” attached to Government Decision No.890/29.07.2003, as amended.

Alternative 0: represented “abandoning” the construction works already implemented on the site of units U3 and U4 and supplying the necessary energy from a 1400 MWe thermal power plant using classic fuel (gas, heavy fuel oil, coal).

Implementation of such a plant on the Cernavodă site will involve, inter alia, the building of a “fuel management facility”, an installation that cannot be built on the current site, as it requires large built on areas.

The other 3 scenarios investigated for meeting national energy demand for the 2025 horizon shared a common and a differentiating part each.

Scenario A considered meeting the energy demand by installing 13×255 MW (3315 MW) in combined cycle plants, gas turbines - steam turbines using natural gas which, for 2025, would determine a natural gas consumption of 3.46×10^9 m³.

Scenario B considered maintaining a quasi-constant annual consumption of lignite and pit coal as provided in the Energy Roadmap for Romania by 2025 and installing 3×255 MW (765 MW) in combined cycle plants gas turbines - steam turbines using natural gas, of 14×165 MW (2310 MW) in combustion plants with fluidised bed at atmospheric pressure and recirculation operating on lignite and 2×165 MW (330 MW i.e. a total 3405 MW) in combustion plants with fluidised bed at atmospheric pressure and recirculation operating on pit coal at a consumption rate for 2025 of 23 million ton lignite, 1.3 million ton pit coal and 0.8×10^9 m³ natural gas.

Scenario B considered building unit U3 at Cernavodă (700 MW) and installing 14×165 MW (2310 MW) in combustion plants with fluidised bed at atmospheric pressure and

recirculation operating on lignite and 2×165 MW (330 MW i.e. a total 3340 MW) in combustion plants with fluidised bed at atmospheric pressure and recirculation operating on pit coal at a consumption rate for 2025 of 23 million ton lignite, 1.3 million ton pit coal and 1.8 million tcc nuclear fuel.

The criteria used in comparing the long term scenarios were grouped into three categories : technical-economic, environmental impact-related and social impact-related.

The multi-criteria analysis showed that the preferable scenario would include implementation of Unit 3.

Subsequently, when the possibility of implementing Unit 4 was also included, analysis of criteria “total discounted expenses”, “environmental impact”, and “technical-economic impact”, it was found that the operation of Units 3 and 4 at Cernavodă will determine a stronger differentiation between the preferable scenario and the other scenarios previously considered.

The alternative proposed by this project is the best alternative for the following reasons:

- it aims to continue the works on Units 3 and 4 on the Cernavodă NPP site; these works were interrupted and replaced with conservation works.
- since the site was approved, construction works on Units 3 and 4 have been implemented as follows: on U 3 - 52% of the civil works on the nuclear and classic side and 49% of the hydrotechnical works, water supply and sewerage; on U 4 - 15% of the civil works.
- The Cernavodă NPP site, with 4 CANDU-type units was approved by “State Council Decree No. 15/10.01.1979 approving the siting of Cernavodă NPP with a CANDU-PHW 600 MWe-type nuclear reactor, with 4 units 660 MWe each, on the Cernavodă site and implementation of installation works under a derogation regime, before the preparation of the execution project”.
- the site contains “Unit 0” the unit that supplies shared services for all the nuclear units (Chemical Water Treatment Plant, Starter Heating Plant and Fire Pump Station). “Unit

0” was also sized to serve the needs of Units 3 and 4.

Selection of the nuclear power plant site was based on considering the physical characteristics of the site (seismological, geological, meteorological and hydrological), the socio-demographic and land use features, the design characteristics of the reactor in accordance with the nuclear safety criteria and requirements.

Specialists of Bucharest University and international experts cooperated in defining and confirming the geological and seismic conditions.

The seismological site data used in designing Cernavodă NPP were determined by the National Research and Development Institute for Earth Physics and later assessed by independent experts.

The National Commission for Nuclear Activities Control and the International Atomic Energy Agency coordinated verifications and expert studies of the site and of the Project, using the updated guidelines and recommended methodology to demonstrate assurance of nuclear safety and confirm the interpretations used in the site studies of Cernavodă NPP.

Completion of Units 3 and 4 will lead to an increase of electricity production capacity at Cernavodă NPP by an output of at least 1440 MWe, in order to meet the additional national and regional demand for stable electricity supply with low carbon emissions.

Reasons that Justify the Decision to Issue the Environmental Agreement

- the land on which construction of Units 3 and 4 is to continue is owned by “Nuclearelectrica” National Company S.A.- Cernavodă NPP Branch and classed in the category “sub-zones and production facilities belonging to the NPP”.
- the siting permit for the CANDU-type nuclear plant for 4 nuclear units was issued By the State Committee for Nuclear Energy in 1978.
- it is a strategic project, necessary to provide energy security for the country by ensuring a good balance between the national demand and supply of energy, and is one of the major projects contributing to the optimum development scenario for the national

energy supply system for 2007-2020, in accordance with the document *Romanian Energy Strategy for 2007-2020 updated for 2011-2020*.

- the possibility of ensuring the necessary flow rates for the open circuit operation of 4 700 MW nuclear units for a 97% rated output is a condition for the operation of Units 3 and 4; this condition is also included in Water Management Endorsement No. 54/2013 . Thus, nuclear units U3 and U4 will only be commissioned after the commissioning of the river works on the Danube to change the distribution of water flows on the Bala, Borcea and Old Danube arms, respectively. Once these works have been implemented, it is estimated that they will be able to provide the following parameters:

- minimal flow rates ensured for the Old Danube, downstream of the Bala branching, will be 40 - 42% of the single Danube water flow at Silistra;

- minimal water levels on the Bala arm reduced by 0.80 m and increase thereof in the Old Danube arm, downstream of the Bala branching, by 1.20 m, and 1.08 m, respectively, in the Cernavodă section.

- the project impact on biodiversity was assessed and it was concluded that the project will have insignificant impact on the protected species and habitats, the natural protected areas and Natura 2000 sites in the area, i.e.: ROSCI0022 Canaralele Dunării, ROSPA0002 Allah Bair-Capidava and ROSPA0017 Canaralele de la Hârșova. No natural habitats and/or species of community interest that might be affected by the project implementation were identified on the project site and in its close proximity. The Project will not cause significant damage or loss of natural habitats of community interest and will not use resources on which the biological diversity of the natural protected areas of community interest depends.

- the environmental impact assessment procedure provides complex information in the specific areas of competence of other national regulatory and control authorities (nuclear, public health, water management and emergency management), representative information for the current state of the permitting procedure. These reflect the

implementation of the project and the operation of Cernavodă NPP in accordance with the national and international legislation.

- the points of view expressed by the national authorities represented on the central Technical Review Committee: National Commission for Nuclear Activity Control, Ministry of Economy, Ministry of Health, Ministry of Internal Affairs-General Inspectorate for Emergency Situations, Ministry of Transport, Ministry of Agriculture and Rural Development, Ministry for Regional Development and Public Administration, Ministry of Environment and Climate Change, “Romanian Waters” National Administration, National Environmental Protection Agency.

- Commission Opinion of 26.11.2010 under art. 43 of the Euratom Treaty regarding the completion of units 3 and 4 of the Nuclear Plant of Cernavodă, Romania.

- the comfort letter regarding the permitting of Units 3 and 4 of Cernavodă NPP issued by the National Commission for Nuclear Activity Control (May 2012) states that the project is permissible under the specific nuclear legislation in force and reiterates the improvement proposals derived from the reassessment of the nuclear safety margins (“stress tests”) for the European nuclear power plants, as requested by the European Council and European Commission after the accident at Fukushima (Japan).

- the nuclear safety measures comply with the basic principles set under Directive 2009/71/EURATOM of the Council of 25 June 2009 on instituting a Community framework for nuclear safety in nuclear facilities.

- the report of the seismic hazard assessment mission, issued by the International Atomic Energy Agency (July 2012) titled “Report on the 2nd follow up review mission for the probabilistic seismic hazard analysis and development of design basis ground motions for the Cernavoda NPP Units 3&4” .

- the update of the terrorist attack risk assessment for Cernavodă NPP conducted by the National Commission for Nuclear Activity Control in cooperation with the state authorities with responsibilities in preventing, combating and responding to events of

this kind (year 2012).

The analysis considers all the relevant information on the terrorist attack risk, the latest requirements and guidelines of the International Atomic Energy Agency on nuclear safety and physical protection, and the recommendations of the Ad Hoc Group on Nuclear Security (AHGNS) established by the European Union Council.

- the national policy on radioactive waste management has been aligned to the international requirements established by the “Joint Convention on Safe Spent Fuel Management” developed by the International Atomic Energy Agency and ratified by Romania under Law No.105/1999 on ratifying the Joint Convention on Safe Spent Fuel Management and on the Safety of Radioactive Waste Management, adopted in Vienna on 5 September 1997, and to the radioactive waste management policy promoted by the European Union.

Compliance with the Community legislation transposed into the national legislation

- Directive 2011/92/UE of the European Parliament and Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, transposed into the national legislation by Government Decision No. 445/2009 on assessing the impacts of certain public and private projects on the environment, as amended.
- The Water Framework Directive 2006/60/EC transposed into the national legislation by the Water Law No.107/1996, as amended.
- Directive 2006/60/EC of the European Parliament and Council of 23 October 2000 establishing a framework for Community action in the field of water policy transposed into the national legislation by the Water Law No.107/1996, as amended.
- Council Directive 98/83/EC of 3 November 1998 on the quality of water for human consumption, transposed into national legislation by Law No. 458/2002 on the quality of drinking water, republished as amended.

- Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States, transposed into the national legislation by Government Decision No. 100/2002 approving the Quality Norms to be met by surface waters used as drinking water and the Norms on measurement methods and sampling and analysis frequency of surface waters for the production of drinking water, amended by Government Decision No. 567/2006.
- Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment as amended, transposed into the national legislation by Government Decision No. 188 /2002 approving the norms for wastewater discharge into the aquatic environment, amended by Government Decision No. 352/2005.
- Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life, amended, transposed into the national legislation under Government Decision No.202/2002 on approving the technical quality norms for surface waters requiring protection and improvement in order to support fish life, as amended.
- - Directive 2006/11/EC of the European Parliament and Council of 19 February 2006 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community, transposed into the national legislation by Government Decision No. 351 of 19 April 2006 on approving the Phase Out Program for discharges, emissions, and spills of priority hazardous substances, amended by Government Decision No. 1038/2010.
- Directive 91/271/EEC concerning urban waste-water treatment as amended, transposed into the national legislation by Government Decision No. 188 /2002 approving the norms for wastewater discharge into the aquatic environment, amended by Government Decision No. 352/2005
- Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life, amended, transposed into the

national legislation under Government Decision No.202/2002 on approving the technical quality norms for surface waters requiring protection and improvement in order to support fish life, as amended.

- - Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community, transposed into the national legislation by Government Decision No. 351 of 19 April 2006 on approving the Phase Out Program for discharges, emissions, and spills of priority hazardous substances, amended by Government Decision No. 1038/2010.
- Directive 2008/50/EC of the European Parliament and Council of 21 May 2008 on ambient air quality and cleaner air for Europe and Directive 2004/107/EC of the European Parliament and Council of 15 December 2004 on arsenic, cadmium, mercury, nickel. Polycyclic aromatic hydrocarbons in the ambient air, transposed into the national legislation by Law No. 104/2011 on ambient air quality.
- The Habitats Directive 92/43/CEE concerning on the Conservation of natural habitats and of wild fauna and flora and the Birds Directive 79/409/CE concerning the conservation of wild birds, amended by the Birds Directive 2009/147/CE transposed into the national legislation by Emergency Government Ordinance No. 57/2007 on the regime of protected natural areas, the conservation of natural habitats and wild flora and fauna as amended, approved by Law No.49/2011.
- Directive 2008/98/EC on waste and repealing certain directives, transposed into the national legislation by Law No. 211/2011 on the regime of waste.

How it relates to/complies with the environmental protection objectives for the area

Following the analysis and further investigations of the appropriate assessment study and of the interpretation thereof it is appreciated that the Project for Units 3 and 4 of Cernavodă NPP has considered the following:

- the environmental objectives established by the Water Framework Directive, as promoted and implemented by Government Decision No. 80/2011 on approving the

National Management Plan to the part of the international River Basin of the Danube included in the Romanian territory;

- the directions of national and European interest of the European Union Strategy for the Danube Region approved by the European Commission on 8 December and adopted on 24 June 2011 on the European Council;

- directions de national and European interest of the European Union Strategy for the Danube Region and associated Action Plan.

Consideration of the direct, indirect and cumulative impacts of all the activities present in the area

The activities conducted in the Project area, on an approximate 10 km radius of Cernavodă NPP were grouped into the following 4 areas: industrial area Cernavodă – Saligny, Cernavodă Industrial Harbour area, the dispersion area around Cernavodă Town and the dispersion area around the communes of Mircea Vodă and Stelnică. The main business activities include: businesses (naval, oil product storage and distribution, farming activities, construction works, clay quarries); oil and petrol transport mains (Constanța–Pitești, Constanța-Ploiești, Constanța-Borzești and Ploiești-Constanța); road, railroad, naval transport (the Old Danube and the Danube-Black Sea Canal).

The business objectives and activities currently conducted in the area of the nuclear plant do not cause a cumulative impact with the type of activity conducted by Cernavodă NPP operating with 4 units.

III. Measures for the prevention, reduction and, where possible, for the compensation of the significant side effects upon the environment.

The Project Owner has the obligation to comply with all the procedures, approaches and measures described in the environmental impact assessment documentation underpinning the issuance of this Environmental Agreement. The Project Owner shall take all the measures provided by the national legislation, including the laws related to the nuclear sector, and by the international legislation, for implementing

and ensuring the highest physical protection and nuclear safety requirements as early as the design stage, and, later, in the commissioning period, during the operation at nominal capacity and response to contingencies, in the decommissioning and site restoration period, in order to ensure a high level of protection for the personnel, population and environment.

a) Measures during the project implementation

a1) Water quality protection

The Project Owner has the obligation to take the necessary measures in order to eliminate or reduce any negative impact on surface and ground waters, by applying the ALARA principle (As Low As Reasonable Achievable), during the construction works period, as well as during the technological operation tests period.

All water discharges into receivers shall be done as required by the Water Management Endorsement (in force) issued for Units 3 and 4 of the Cernavodă NPP, also correlated with the conditions and measures provided within the Water Management Licence (in force) issued to the Cernavodă NPP's Units 1 and 2.

During the work execution, all the necessary measures required to avoid water pollution, to protect the environment, the surrounding areas shall be taken to prevent and fight against accidental polluting leaks, involving especially oil products, as a result of the of process equipment operation.

The sludge generated from the waste water treatment in pre-treatment plants shall be properly stored and then disposed in compliance with the law.

a2) Ambient air protection; protection against noise and vibrations

The Project Owner shall take all the necessary measures so that the air polluting emissions from the operating equipment and machinery should not exceed the limit values allowed by Law No. 104/2011 concerning the Ambient Air Quality, and should comply with the provisions of the regulations in force concerning the acceptable noise limit values during technological testing as well as when operating at full capacity.

The suspended particles and powder resulting from pipe cleaning activities shall be collected by the air filtering systems connected to the sand blasting equipment.

It will be ensured that the noise level of machinery and equipment should meet the range provided in the technical specifications (book) and should not exceed the regulated limits.

a3) Protection of the soil, subsoil and groundwater

The Project Owner shall take all the measures to ensure that all the activities conducted during the construction works , technological testing and commissioning should not involve the pollution of the soil, subsoil and ground water.

a4) Waste management

The waste generated in the project implementation shall mainly include the following: demolition waste (earth and concrete debris), waste from waterproofing repairs, asphalt, bitumen, sludge from various chambers (potentially contaminated with oil waste), packaging waste and textile waste (damaged or used protective equipment, etc.), iron and steel scrap, plastics, paints, paper, board and spent oils.

The legal provisions, procedures and measures to prevent and/or reduce accidental leaks, the waste management procedures for the construction- related scrap, for regular maintenance of equipment and vehicles, and for the proper handling and storage of fuels and materials shall all be complied with.

The Project Owner shall take all the necessary measures to collect and appropriately store non-radioactive industrial waste generated during the project implementation and to ensure that the waste collection, transport, disposal or recycling operations are conducted by specialist certified companies.

The Project Owner shall take all the necessary measures to ensure the safe management of the potential generated RAW and shall ensure the implementation of such measures in the technological testing as well as in the commissioning period.

a5) Nature protection/ protection of the natural protected areas of community interest

The Project shall not use resources on which the biological diversity of the natural protected areas of community interest depends.

No material or substance that might affect the species and/or natural habitats of community interest shall be stored on the Project site and on the site logistics camp.

The works shall be conducted in such a way as to ensure good conservation conditions for the species and habitats on such special sites.

a6) Protection against radiations

As soon as the fuel is loaded into the reactor, the Project Owner shall take all the measures to protect the personnel, the population and the environment as provided by the Basic Radiological Safety Norms approved by the National Commission for the Nuclear Activity Control, in order to avoid contamination/ discharge of radioactive emissions.

b) Measures during operations and the effects of their implementation

b1) Water quality protection.

The optimum operation of the non-radioactive liquid effluent pre-treatment plants shall be ensured. The Project Owner shall regularly check the functional integrity of the drainage systems associated to the reactor building, the spent fuel tank and the auxiliary service building in order to prevent any potential effect on the groundwater.

The storm water on the fuel management facility and on the oil unloading installation, after having been pre-treated in the oil separator, will be taken over by the storm water sewerage system.

The leaks occurring during normal and abnormal operating regimes of certain process systems (the machine room, the structure connecting the machine room and the service building, the cooler house) shall be collected into the inactive drainage system and discharged by pumping ($Q_{\max_{ev}} = 20$ l/s) into the storm water sewerage system, after being subjected to dosimetric control (tritium and gamma). The integrity of the drainage and sewerage systems shall be regularly checked.

The actions provided in the regular control procedures to avoid potential penetration/leaks of radioactive or non-radioactive products into the groundwater shall be complied with.

The Project Owner shall establish the response procedures in case of accidental leaks that might endanger the water quality.

The optimum operation of the Radioactive Liquid Effluent Monitor shall be ensured.

The design specifications and requirements enforced under the endorsements issued by the authorities shall be complied with, so that the Project meet the environmental objectives established under the Water Framework Directive and reflected in the “Management Plan for the Danube River, the Danube Delta, the Dobrogea hydrographic area and the coastal waters”.

In extreme situations when the Danube flow rates do not meet the optimum levels required for operation at nominal power (drought) the operating procedures for the abnormal operation of the Cernavodă NPP shall be implemented as established by the Owner, to ensure the operation or, as the case may be, the controlled shutdown of one or more nuclear units, when the water level in the distribution tank is extremely low.

b2) Ambient air protection; protection against noise and vibrations

The Project Owner shall take all the necessary measures to ensure that flue gas emissions (SO₂, NO_x, CO and suspended particles PM10, PM2.5) generated during the operation of the Starter Heating Plant even during short periods of time (on starting up or closing down the nuclear units), although not continuous, might not affect the air quality, as required by Law No. 104/2011 on ambient air quality.

During the operation of Units 3 and 4, no kind of continuous polluting non-radiation emissions are not expected. The transitory emissions or the emissions from mobile sources (generated from vehicles passing through the site) will be mitigated by management measures and specific procedures elaborated by the Project Owner and

shall also include technical inspections of the road vehicles to ensure they operate within the regulated pollution range.

The radioactive emissions during operations at normal capacity shall comply with the norms of the National Commission for the Nuclear Activity Control.

The optimum operation of the Radioactive Gas Effluent Monitor shall be ensured. In case of potentially exceeding the approved values, actions shall be taken in accordance with the plant procedures for the immediate remediation of any potential malfunction.

The noise and vibrations generating equipment (pumps, fans) shall be provided with dampers and buffers and located inside the buildings. The noise and vibration levels from other equipment (steam valves, electrical transformers) shall not exceed the limits provided in the regulations in force.

b3) Protection of the soil, subsoil and groundwater

The potential soil and subsoil pollution sources may be leaks of fuel, oils, chemicals resulting from the handling, management of solid waste, management of non-radiation industrial waste.

The regular surveillance and remediation (if necessary) of the tub-like concrete platforms with antacid lining and of the railway chemical tanker unloading bay supplying the chemicals necessary for the process.

A sealing screen, designed to control the groundwater on the plant site, is provided around the nuclear area of each nuclear unit, vertically descending down to the impervious marl bed. .

The level of the groundwater on the Cernavodă NPP site ranges, under the natural regime, from 8.50 mbBS normal level to a maximum level of 12.00 mbBS, depending on the Danube water (distribution tank) levels.

The protection of the structures and basements of the nuclear buildings against the rising groundwater levels is provided by a reinforced concrete screen that creates a sealed enclosure around the nuclear buildings and by a deep watertight diaphragm built

by cement milk injection into the bedrock cracks, through 40 m deep borings. A drainage system is provided within these screened enclosures in order to maintain the groundwater level below + 8.50 mbBS.

The drained screened enclosures will be built around the buildings of each unit, from the surface (elevation 16.30 mbBS) down to the impervious marl bed.

b4) Waste management:

(1) Management of non-radioactive non-hazardous/ hazardous waste

The waste generated during the operation of units U3 and U4 is collected on the site, generally within the department that has generated it, where it is separated by category, in compliance with the law.

The fluid or solid hazardous non-radiation waste includes lead batteries, oils, solvents, biological samples, glycol, flammable solvents, biological sample containers, emulsions, etc.

The hazardous non-radiation waste is strictly stored in labelled barrel-type containers at the collection centre and at the temporary storage facility on the premises. The temporary storage areas for hazardous non-radioactive waste are located on the plant premises in specially designed areas. The areas are marked and zoned so as to allow easy identification of their purpose, and all the barrels are stored on pallets. The spaces are regularly inspected by the maintenance personnel for container integrity and to avoid damage and loss of labels.

The temporary storage areas are provided with emergency cabinets equipped with leak response materials.

The waste monitoring, collection, temporary storage, disposal and transport off site to facilities authorized for storage, recycling and disposal shall be done in an efficient and safe way for the environment and the population, in compliance with the law.

The provisions of the national waste management shall be complied with.

The transport of non-radioactive non-hazardous/ hazardous waste containers for

temporary storage or disposal shall involve vehicles authorized for the transport of non-hazardous/hazardous waste, properly and securely packed up and fixed for transportation.

The plastic bags containing hazardous solid waste shall be transferred to metal containers.

The non-radioactive hazardous waste generated by the Cernavodă NPP may be radioactively contaminated. The waste containers from the radiological areas shall be monitored for tritium and gamma, prior to transfer outside the radiological area, for disposal by authorized waste collecting companies, or for storage in specially designed plant facilities. If values above the approved limits are detected, they shall be considered radioactive waste and treated according to the RAW procedures.

(2)Radioactive waste management

The radioactive waste from the operation of units U3 and U4 shall be managed in accordance with the community requirements specified in the European Commission Report “Seventh situation report - Radioactive waste and spent fuel management in the European Union” of 2011 and the Directive 2011/70/ Euratom of the European Council of 19 July 2011 requiring the establishing of a community framework for the responsible and safe management of spent fuel and radioactive waste.

The radioactive waste management includes all the administrative and operational activities involving the collection, handling, storage, transport and disposal of all RAW generated by Units 3 and 4 of the Cernavodă NPP.

The RAW generated within the Cernavodă Units 3 and 4 includes:

- solid radioactive waste (paper, textiles, plastic scrap, protective equipment, glass, wood, metal parts, concrete debris, spent filters, spent resins);
- liquid radioactive waste (waste oils, spent solvents, scintillation liquid mixes);
- spent fuel.

The RAW from the Cernavodă NPP’s Units 3 and 4 (liquids and solids) is generated by the current operation and maintenance activities.

The waste so generated is collected separately as compactable waste, segregated (based on the generating source and the material type), monitored, compressed (for volume reduction) and transferred to the Interim RAW Storage Facility.

The spent resins are stored separately in three reinforced concrete tanks of 200 cubic meters capacity each, covered with epoxy resin and placed in the basement of the Service Building.

The storage of the spent fuel from the operation of Units 3 and 4 of the Cernavodă NPP is provided in the following ways: wet storage, in the spent fuel bay and dry storage in the Interim Spent Fuel Storage Facility.

The bundles of spent fuels removed from the nuclear reactors are wet stored in the Spent Fuel Bay of the plant for at least 6 years, while the fuel activity and residual heat undergo decay. Subsequently, the spent fuel is loaded on storage hoppers and transferred to the Interim Spent Fuel Storage Facility. The spent fuel is stored, for at least 50 years, in dry concrete modules fitted with storage cylinders (enclosures). The existing Interim Spent Fuel Storage Facility on site was initially designed with the necessary space and exterior facilities to accommodate a total of 27 modules.

Should the Interim Spent Fuel Storage Facility need to be enlarged, the regulatory procedures shall be observed in accordance with the environmental and nuclear legal provisions.

The final disposal of the RAW and spent fuel generated during the operations of the Cernavodă NPP's Units U1-U4 shall be located in a Final Low and Medium RAW, i.e. a national geological repository to be built in compliance with the Order of the President of the Nuclear Agency No. 844/2004 approving the medium-term and long-term National Strategy for the management of spent fuel and radioactive waste, including the final disposal and decommissioning of nuclear and radiological installations.

b5) Management of hazardous substances and mixtures

The used toxic substances are: ammonia, sulphuric acid, hydrogen chloride, carbon oxide, etc. Measures shall be taken to locate the tanks containing such hazardous substances so as to avoid any potential release into the ambient air and to provide protection based on distance.

b6) Nature protection/ protection of the natural protected areas of community interest

The appropriate assessment study proposed a number of measures, set in the context of meeting the national and European interest directions of the European Union Strategy for the Danube Region and the associated Action Plan, in point of monitoring and preserving the biodiversity and protected areas within the Project impact area.

The measures proposed for the monitoring programme have been corroborated with the requirements of the “Romanian Waters” National Administration contained in the Water Management Endorsement No. 35/2011 renewed as the Water Management Endorsement No. 54/2013, and support the actions contained in the Action Plan associated to the Strategy.

Until the development of the minimum conservation measures for the species and habitats that underpinned the establishment of natural protected areas within the Project influence area, the measures under art. 33 of the Emergency Government Ordinance No. 57/2007 on the regime of protected natural areas, conservation of natural habitats and wild flora and fauna, as amended by Law No. 49/2011, shall be complied with, namely:

- for the species of protected plants and animals, other than birds, the following shall be forbidden: any kind of collection, capturing, killing, destruction or injury to the individuals in their natural environment, at any stage of their biological development; intentional disturbance during the mating, breeding, hibernation and migration season; damage, destruction and/or intentional collection of nests and/or eggs from nature; damage and/or destruction of breeding or resting places; picking of flowers or fruits, intentional picking, cutting, uprooting or destruction of such plants in their natural habitats, in any stage of their biological development; holding, transport, sell or

exchange for any purpose, as well as offering for exchange or sale individuals taken from nature, at any stage of their biological development.

- for the species of protected birds, including migratory birds, the following shall be forbidden: intentional killing or capturing, irrespective of the used method; deterioration and/ or intentional collection of nests and/or eggs from the wild; picking of eggs from nature and keeping them, even if emptied; intentional disturbance, especially during the breeding or maturing periods; possession of individuals of species whose hunting and capturing are forbidden; as well as sale, possession and/or transport with a view to selling or offering for sale, live or dead, or of any easily identifiable parts or products made of them.

b7) Protection against radiations

(1) The Project of the Cernavodă NPP's Units 3 and 4 provides measures for the protection against radiations for the on-site personnel, the public and the environment, for both normal and emergency situations.

During normal operation

The following main measures are established for the on-site protection against radiations during normal operation:

- a) for the plant personnel: source control (includes measures and activities required for the identification and removal or decrease of internal and external radiation hazards); reduction of impurities using technical solutions; maintaining low levels of activity in the process liquids and gases; radiation screening measures (primary, secondary, auxiliary and special screening); placing permanent, temporary or additional screening systems, based on the developed operations; protective measures against contamination; providing stationary and portable radiation monitoring equipment, contamination monitoring equipment, aerosols and process liquid monitoring equipment; providing staff utilities, such as showers, lockers, equipment wash rooms, decontamination spaces;
- b) for the population and the environment:

- effluent control (includes the measures and activities required for monitoring and controlling radioactivity releases into the environment).
- environmental monitoring (includes the measures and activities necessary for measuring the environmental activity levels, in order to assess the radiological impacts on public health and on the environment). For abnormal emissions, additional programmes are in place for precise dose assessment.

In case of accident

In case of accident, special measures are provided for the personnel protection, including the personnel specialized in response and remediation activities. These measures refer to providing safe evacuation routes for the operating personnel and to ensuring that the required post-accident actions of the operators can be safely fulfilled.

The main protection measures provided in case of accident aim at ensuring that the radiation dose received by the operators stay within the acceptable regulated limits.

The main measures for the protection of the nearby population and businesses include:

- ensuring the containment isolation in case of accident, in order to limit the radioactivity releases into the environment;
- Emergency Filtered Containment System in case of severe accident, in order to maintain the containment integrity;
- establishing a 1 km exclusion zone around each reactor, where only plant-related activities may be conducted;
- taking specific location and design measures for the plant systems, to limit toxic or explosive gas releases from the operations, so that the integrity of the plant structures should not be affected;
- each nuclear unit is designed as a functionally independent unit in relation to the other nuclear units.

The radiation protection measures for normal operation, as well as the response measures, in case of an accident with radiological consequences, have been approved by

the National Commission for the Nuclear Activity Control.

The analyses of design base accidents postulated for a nuclear facility have shown that the project-specific active and passive systems will ensure maintaining the reactor in a safe shutdown condition as well as the evacuation of residual heat and radiation confinement, so that the consequences for the public and the environment may be maintained within the regulated limits.

b8) Emergency situation management

The Project Owner shall ensure the implementation of the necessary response measures in case of accident, once the Project of Units 3 and 4 is implemented. The main measures established with the Ministry of Internal Affairs – The General Inspectorate for Emergency Situations and other authorities with responsibilities in this area include:

- developing the site Emergency Plan in compliance with the nuclear regulatory body requirements and with the standards and guidelines of the International Atomic Energy Agency.
- establishing an on-site emergency response organisational structure including members of the personnel of the Cernavodă NPP's Units 3 and 4; this structure will act in accordance with the site Emergency Plan as approved by the National Commission for the Nuclear Activity Control.
- measures to train the facility personnel on the theoretical and practical implementation of the site Emergency Plan.
- ensuring the notification of the relevant public authorities (City of Cernavodă, Inspectorate for Emergency Situations in Constanța, General Inspectorate for Emergency Situations in Bucharest, the National Commission for the Nuclear Activity Control) by entering into notification protocols with these authorities;
- regularly organising emergency drills involving the Cernavodă NPP's personnel, to evaluate the response capacity of the personnel of the Cernavodă NPP's Units 3 and 4;.

- evaluation, based on regular tests performed through general emergency drills carried out by the NPP with the public authorities, of how the personnel of Units 3 and 4 interact with the public authorities in case of emergencies;
- establishing the necessary and effective measures to prevent, reduce and control transboundary impacts, in case of accident.
- providing the citizens with individual protection equipment within the planned emergency areas, as per art. 5 paragraph (1) of the Annex to the Government Decision No. 501/2005 approving the criteria for providing the citizens with individual protection equipment ;
- providing the support, free of charge, of the emergency response teams in case of emergency, with the necessary equipment, substances, devices and antidotes for the specific risks as per art. 28 paragraph (1) of Law No. 481/2004 on civil protection, republished and amended.
- organisation and execution of the radioactive, chemical and biological contamination control of the raw materials and finished products and implementation of the decontamination measures for the plant own personnel, land, buildings, installations and machinery as per art. 51 of Law No. 481/2004 on civil protection, republished and amended.
- providing protection by accommodating their own employees in case of an incident/radiologic/nuclear accident as per art.45 paragraph(1) of Law No. 481/2004 on civil protection, republished and amended.

Romania is a signatory Party to the following international conventions on emergency response: the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency, ratified by the Decree No. 223/1990 of the Provisional Council for National Union.

c) Measures for the Shutdown/Dismantling/Decommissioning and Site Rehabilitation

The decommissioning of a power plant is regulated by Law No. 111/1996 on the safe development, regulation, authorization and control of nuclear activities, republished and amended and by the “Norms on the specific requirements for the quality management systems applied to nuclear facilities decommissioning” (NMC-11). The decommissioning planning is also based on current international standards. The decommissioning planning complies with the following international standards and requirements : IAEA, Safety Standard Series - *Decommissioning of Nuclear Fuel Cycle Facilities*, Vienna, 2001 and US-NRC Regulatory Guide 1.184 – *Decommissioning of nuclear power reactors*, 2000.

The specific decommissioning internal norms and international standards recommend the development of a 3-stage Decommissioning Plan as follows:

- Initial Decommissioning Plan, developed as early as the nuclear facility design and construction stage;
- Decommissioning Plan, developed during the operational stage of the nuclear facility;
- Final Decommissioning Plan, at the end of the operations period, required for the actual initiation of the decommissioning process.

The decommissioning method proposed for Units U3 and U4 involves the decontamination and dismantling of the contaminated and/or activated equipment and structures shortly after the final closedown of the nuclear units. Spent nuclear fuel and RAW are collected and sent to final disposal. Such actions will ensure site clearance for other uses shortly after the final shutdown of the operation activities.

c1) Short description of the decommissioning operations for Units 3 and 4

In the decommissioning process of the nuclear units, a number of buildings, structures, installations and equipment related to them will be decontaminated, dismantled, demolished and removed.

For the safe implementation of a nuclear unit decommissioning process, the following key elements will be considered in point of impact on the personnel, on the public and the environment: the radiological condition of the plant (the extent of the

contamination or activation of the structures and systems); the physical condition of the structures and of the process systems of the plant to be used as ancillary or protective systems during the decommissioning operations (the extent of deterioration, functionality); the physical condition of the plant command and control systems used during the decommissioning operations; the condition of the electrical systems, hoisting and carrying facilities; the physical condition of the structures to be used as confinement and protective screening structures during decommissioning; records of the plant operational history, general plans and lists of equipment, components and structures.

The decontamination of the surfaces, constructive elements of the decommissioned buildings, of the equipment and installations, etc. is the essential operation aiming at removing the radioactive contamination in order to reduce the residual activity levels in/on the materials within the plant or on the site.

The recommendations of the international good practice guidelines shall be applied in selecting the procedures for the chemical, electrochemical and mechanical decontamination.

c2) General protection measures for the population and the environment during the decommissioning process

The main protection measures for the population and the environment are the following: source control, effluent control, environmental monitoring, reassessment of the initial monitoring programme according to changes that that may occur during the decommissioning process.

The general operations carried out for site remediation and rehabilitation after the building demolition include: soil samples collecting and analysis; removal of any potentially contaminated soil; restoration of the site geometry by soil levelling and fixing by successive layers of topsoil and vegetation (grass, shrubs).

IV. Conditions to Be Met

The Project Owner shall comply with all the conditions specified in the

endorsements, agreements, permits, authorizations, etc. as obtained for the implementation of this project.

The Project Titleholder shall be liable throughout the Project and after shut down for compliance with Law 111/1996 on the safe deployment, regulation, authorisation and control of nuclear activities, republished as amended.

The Project Owner has the obligation to comply with the provisions of the nuclear legislation issued by the National Commission for Nuclear Activity Control, as the national regulatory authority in the nuclear sector and shall be accountable for the implementation of the technical design norms provided by the national legislation, including of the internationally recognised ones.

The Project Owner shall comply with all the requirements of the national legislation, including in the nuclear sector, and with the international ones, in order to ensure and implement the highest standards of physical protection and nuclear safety, as starting early in the design stage, and later during commissioning, normal operation and accident response, during decommissioning and site remediation , in order to provide a high level of protection to the personnel, the population and the environment.

The Project Owner shall demonstrate that all the actions have been taken to ensure the protective measures for the exposed personnel, the public and the environment, so as to ensure that all the exposures, including potential exposures, are maintained at the lowest reasonable level, considering the economic and social factors (the ALARA principle).

The Project Owner shall correlate the construction and commissioning works on Units 3 and 4 with the improvement works on the Danube River aimed to change the flow rate distribution along the Old Danube arm at low water level, so as to secure the minimal operating water levels and flow rates for the safe operation of all 4 nuclear power units. The improvement works on Danube River shall be correlated with the works included in Project “Improved navigation conditions along the Danube from

Călărași to Brăila and complementary measures” where the investment Owner is the Ministry of Transport – Lower Danube River Administration.

1. During project implementation

- a) Technical conditions required by the specific (Romanian or Community) regulations, as applicable

Process equipment shall comply with the provisions of Government Decision No. 332/2007 on setting up the type approval procedure for engines to be installed on non-road mobile machinery and engines of road vehicles for the transport of people and goods and the establishment of measures to limit gas and pollutant particle emissions from them, in order to protect the atmosphere.

- b) Technical conditions deriving from the environmental impact assessment report integrating the findings of the appropriate assessment, as applicable

Considering the need to monitor temperature variations in the Danube water in the area of the altered temperature plume, the Project Owner shall develop a study to indicate the technical options in developing and implementing a temperature monitoring programme for this area, also taking into account elements of the recommendations contained in the appropriate assessment study as developed by the National Research and Development Institute “Danube Delta” in Tulcea.

- c) Necessary conditions to be met in the construction site development

Construction and regular site roads shall be constantly maintained by grading and sprinkling with water to reduce the amount of suspended particulate matter. Work is to be done in phases, as provided by the project, so that the impact on air quality should be minimal.

The machinery/equipment used in the construction site development works shall not exceed the acceptable noise power levels according to art. 12 of Governmental Decision No. 1756/2006 on limiting environmental noise emission levels from equipment used outside buildings. Such machinery/equipment shall have the acoustic

power level marked under Chapter XI and comply with the provisions of Article 9, Annex 2 and art.8 of Government Decision No. 1756/2006.

Heavy duty and light transport vehicles carrying construction materials and equipment along the routes within the limits of Cernavodă town, in the residential areas near such routes shall be operated so that:

- they shall not lead to an exceedance of the acceptable equivalent noise limit levels under STAS 10009/1998 Acoustics in buildings, urban acoustics, acceptable noise limit values.
- they shall not lead to an exceedance of the acceptable limit values of vibrations generated by propagation through the road structure or the road bed, under Romanian standard 12025-2 Acoustics in buildings, vibration effects on buildings and parts of buildings, acceptable values.

Waste generated during construction works (industrial construction waste, recyclable waste, hazardous industrial waste, municipal-type waste) will be collected in an organised manner and removed from the site, in conformity with the provisions of the Law No. 211/2011 on the regime of waste and the waste management national legislation.

The selective collection of the waste generated from the construction works, their storage and disposal based on their nature, through specialised contractors, under a contractual basis, according to the law, are mandatory.

In case of accidental soil pollution, it is recommended that the polluted soil should be removed and stored in containers before incineration or clean-up.

Vehicle traffic serving the construction-assembly works for the Project shall not use any route other than as established for the construction site operation (access roads and process roads).

d) environmental monitoring plan

d1) Domestic/storm water monitoring

Source	Sampling location	Indicators
Domestic waste water	Monitoring points to be established by ABADL ¹ and RAJA ² Constanța	According to the provisions of GD No. 188/2002, as amended by GD No. 352/2005-NTPA 002.
Storm waters, including from groundwater drainage and water stored in the exterior drainage sump	Upstream of the Cernavodă NPP abstraction tank inflow	Under GD No. 188/2002, as amended by GD No. 352/2005-NTPA 002.

NB: ¹ ABADL: Danube-Black Sea Coast Water Basin Administration

² RAJA: County Water Regie Autonome

d2) Monitoring of the Danube temperature in the area of the altered temperature plume

Area	Indicators	Monitored aspects
Cooling water discharge into the Danube via Seimeni valley and in Race II of the DSC ¹ (in special situations)	Temperature	Develop a study for providing the technical solutions for the development and implementation of a temperature monitoring programme, taking into consideration the recommendations of the study on the adequate assessment of the environmental impact prepared by INCDDD ² Tulcea.

NB: ¹ DBSC: Danube-Black Sea Canal

²INCDDD: National Research & Development Institute “Danube Delta”

d3) Air quality monitoring

Source/pollutant	Implementation
Suspended particles PM10 and PM2.5	Typical measures for reduction of emissions in conformity with current legal provisions so as to comply with the limit values provided in the Law No. 104/2011. Construction and regular site roads shall be constantly maintained by grading and sprinkling with water to reduce the amount of suspended particulate matters PM10, PM2.5.
Machinery and equipment used in current construction and assembly activities	Necessary measures to comply with the provisions of GD No. 332/2007.

d4) Non-radiation waste monitoring

Source	Monitoring locations Frequency	Types
Current construction-assembly activities	In general, the power plant site and in particular, at the points of generation/ collection/ temporary storage / and vehicle loading points Permanent frequency	- construction waste; - recyclable waste; - hazardous waste; - municipal-type waste.

Waste management shall be provided in conformity with the provisions of the Law No.211/2011 on the regime of waste, including in regards to the compliance with art. 22 para. (3), and the provisions of the specific legislation on waste management.

d5) Noise and vibrations monitoring

Source	Implementation
Heavy duty and light transport vehicles and equipment operation Equipment operation	According to the provisions of GD No.1756/2006

d6) Biodiversity monitoring

Monitored species	Monitoring areas/implementation/frequency	Monitored aspects
<i>Corbicula fluminea</i> (Mollusca phylum), invasive species	- the control sample to be collected upstream of the cooling water discharge channel; - samples to be collected from the discharge channel and from the Danube, at regular intervals along the length of the plume with modified temperature ; - minimum three annual samplings; to analyse water thermal regime and hydrological differentials. Monitoring stage of 3 years before the	- the dynamics of pediveliger larvae abundance in the cooling water discharge channel of Cernavodă NPP; - pediveliger larvae distribution area; - abundance of adults in the bentos habitats of the Project area.

	commissioning tests for Units U3 and U4.	
<i>Alosa immaculata</i> – (Pisces) shad	<ul style="list-style-type: none"> - to conduct simultaneous study fishing (larvae and young spawn transiting the plume with modified temperatures) in the thermally affected and not affected areas; - to record the flow speeds and temperatures in the typical sections in order to know where the highest flow speed rate area is located (where most shad larvae will flow) and whether the “modified temperature plume” phenomenon is or is not present in that area; - to start monitoring 1 year before the commissioning tests for Units U3 and U4. 	<ul style="list-style-type: none"> - knowledge of the influence of the modified temperature plume on the migration behaviour of adult mackerel; - knowledge of the influence of the modified temperature plume on the migration behaviour and potential effect on the larvae and early spawn of Danube shad; - identifying the presence of early spawn <i>Alosa sp.</i> on the Danube bottom in the final part of the modified temperature plume.

The provisions of Emergency Government Ordinance No. 57/2007 on the regime of protected natural areas, the conservation of natural habitats and wild flora and fauna as amended, approved by Law No.49/2011 shall be met; the presence/absence of wild species shall be monitored with a 2 times/year frequency (in spring and autumn).

The Project Owner shall submit, on a semestrial basis, to the central environmental protection authority and the custodian of the protected areas of community interest, a summary report of the monitoring results, stating the following: the conservation status of the species and habitats of community interest, their presence in the project impact area, any significant change occurred and, if applicable, additional surveillance and/or conservation measures to be applied.

2. During operation

The Project Owner shall comply with all the requirements of the endorsements/ agreements/ permits etc. issued by the relevant authorities, and those deriving from the national and international legislation.

Full commissioning of Units 3 and 4 shall take place after obtaining the environmental authorization for Cernavodă NPP - 4 units, in accordance with the provisions of art. 12 para. (1) of the Emergency Government Ordinance No. 195/2005 on environmental protection, approved by Law No. 265/2006 as amended.

a) Necessary conditions to be met under the specific regulations

Upon commissioning of Units 3 and 4, the National Commission for Nuclear Activity Control shall establish the dose constraints for the whole site and each unit on the Cernavodă NPP site, and the Derived Emission Limits for liquid and gas effluents discharged from the Cernavodă NPP site - 4 units, in accordance with the provisions of the Order of the President of the National Commission for Nuclear Activity Control No. 14/2000 approving the Basic Radiological Safety Norms.

The Project Owner shall conduct an assessment on public health impact, in accordance with art.8 letter e) of Law No.95/2006 on health sector reform, as amended. The public health impact study for the Cernavodă NPP area - 4 units shall be developed in accordance with the provisions of the Order of the Health Minister No. 381/2004 on approving the Basic Health Norms for the safe deployment of nuclear activities.

The Project Owner shall implement the necessary programmes and procedures for the management of emergencies, in accordance with the provisions of the Order of the Minister of the Environment, Waters, Forests and Environmental Protection No.242/1993 approving the republican nuclear safety norms concerning the planning, preparedness and response to nuclear accidents and radiological emergencies, Law No. 481/2004 on civil protection, as republished and amended, and Emergency Government Ordinance No. 21/2004 on the National Emergency Management System, as approved and amended by Law no.15/2005.

The Project Owner shall prepare the Site Emergency Plan for Cernavodă NPP - 4 Units to be approved by the National Commission for Nuclear Activity Control, in accordance with the provisions of art.40 para.(2) and para.(5) of the Law No. 111/1996

on the safe performance, regulation, permitting and control of nuclear activities, republished as amended.

The management of spent nuclear fuel and RAW, including final disposal shall be undertaken in compliance with the national standards and norms on nuclear safety and protection of occupational exposed personnel, public, environment and property, and the international agreements to which Romania is a Party.

The provisions of the Government Ordinance No. 11/2003 on the management of spent nuclear fuel and radioactive waste, including final disposal, republished shall be complied with.

- b) Conditions deriving from the environmental impact assessment report, and the community legislation, as applicable

The Project Owner/operator of Units 3 and 4 shall only use the type of nuclear fuel considered for normal operation in the environmental impact assessment report, i.e. natural uranium in the form of uranium oxide pellets, in accordance with legal provisions in force.

- c) Compliance with the requirements of the specific legislation on air quality, water management, waste/RAW management, noise, nature protection

- c1) Atmosphere protection; noise protection

The Project Owner/operator shall take all the necessary measures when operating the Auxiliary Steam Plant in starting up or shutting down units U3 and U4 to avoid affecting ambient air quality and shall comply with the provisions of the Law No. 104/2011 in ambient air quality.

Equivalent noise limit levels at the boundary of the functional area shall be within the limits provided in STAS 10009/1998, Acoustics in buildings, urban acoustics, acceptable noise limit values.

- c2) Water management

For the safe operation of the whole investment during periods of low waters in the Danube (Old Danube arm), the Project Owner shall comply with the following

requirements of Water Management Endorsement No.54/2013 issued by the “Romanian Waters” National Administration:

- to implement all the necessary investments and adjust all the optimum constructive options to ensure the minimal operating levels in the pumping stations (for circulation and process water);
- to conclude a protocol with the Ministry of Transport – Lower Danube River Administration in order to monitor the development of the improvement works on the Bala arm over time and maintain the works within the designed technical parameters; the improvement works on Bala arm are included in the Project “Improvement of the Danube navigation conditions from Călărași to Brăila and complementary measures”, where the investment Owner is the Ministry of Transport - Lower Danube River Administration Galati.
- to conclude a protocol with the Ministry of Transport–National Company Administration of “Navigable Canals” S.A. Constanța - Lower Danube Administration Galați for the ongoing monitoring of alluvia deposited along the Old Danube arm and at the mouth of the Danube-Black Sea Canal.

The wastewater generated from Units U3 and U4 may not exceed the maximum concentrations for the quality indicators provided in Water Management Endorsement No. 54/2013, upstream of the discharge point in the natural receiver:

Water discharge category	Quality indicators	Maximum values (mg/L)
(Non-radioactive) domestic wastewaters	Under GD No. 188/2002, as amended by GD No. 352/2005-NTPA 002.	
	1. Temperature	(*)
	2. pH	6.5 - 9.0
	3. Suspensions	25
	4. Total ionic Fe	1.5
	5. Chlorides	250

Process water	6. Sulphates	200	
	7. Ammonium	3	
	8. Phosphorus	1	
	9. BOD ₅	15	
	10. Sodium	100	
	11. Calcium	150	
	12. Magnesium	50	
	13. Oil product	5 (minus iridescence)	
	14. Free residual chlorine	0.2	
	15. Hydrazine	0.1	
	16. Morpholine	0.4	
	17. Cyclohexylamine	0.1	
	18. Lithium hydroxide	0.025	
	19. Hydrazine + Lithium Hydroxide mixture	0.1+0.025	
	20. Hydrazine + Morpholine mixture	0.1+0.4	
	21. Hydrazine + Morpholine + Cyclohexylamine mixture	0.1+0.40+0.1	
	22. Rhodamine - discharging into the DBSC	2.0	
	-discharging into the Danube	10.0	
	23. Fluoresceine-discontinuous discharge	0.25	
	24. RGCC 100	1.0 commercial product	
	25. Biomate 5716	1.0	
	26. Biocide MB-40	5.2 active substance 0.01 ml/l comm. product	
	27. Ethylene glycol	<1.0	
	28. ULTIMA scintillation fluid GOLD LLT	0.001 active substance 0.00195 commercial product	
	29. PRAESTOL A3040L	3	
	30. NALCO 3DT149	500	
	Storm waters, including from groundwater drainage and water stored in the exterior drainage sump	Under GD No. 188/2002, as amended by GD No. 352/2005-NTPA 002.	

NB: (*) From the point of view of the thermal load, the temperature of the process waters discharge shall comply with the requirements of the “Romanian Waters”

National Administration as follows:

- into Race II of the Danube-Black Sea Canal (the settling tank of the Recovery HPP) it shall be a maximum 10°C above the temperature of Race I of the Danube-Black Sea Canal, so that the water temperature in this race, downstream of the channel discharge point should not exceed 25°C .
- Into the Danube, it should be a maximum 10°C above the Danube water temperature, but no higher than 35°C , after crossing the mixing area.
- In periods when warm water is injected into the distribution basin the range of Δt shall be analysed by the NPP depending on the temperature of the water in the distribution channel (condensers) and the Seimeni section.

Warm water discharge into Race II of the Danube-Black Sea Canal shall occur in special situations, and only based on approval by the “Romanian Waters” National Administration and by the National Administration Dobrogea-Black Sea Coast, with the acceptance of the National Company “Administration of the Navigable Canals” SA, of the County Water Regie Autonome, on notification of the Public Health Directorate in Constanta and the Environmental Protection Agency Constanta and with the approval of the National Commission for Nuclear Activity Control.

c3) Non-radioactive/radioactive waste management

Non-radioactive industrial waste and domestic-type waste shall be disposed of/recycled/reused and managed as they are generated, in accordance with the Government Decision No.856/2002 on waste management records and approval of the list of waste, including hazardous waste, as amended, the Government Decision No.1061/2008 on the transport of hazardous and non-hazardous waste on the Romanian territory and the Law No. 211/2011 on the waste regime.

Transport of non-radioactive waste along the access roads on Cernavodă NPP site for temporary storage or disposal shall be made by utility car, tractor or/and lorry authorized for the transport of hazardous waste (when the case is) with proper anchoring of the transported goods.

Waste transport out of the nuclear plant site for disposal, storage or recycling shall be provided by companies authorized to provide transport services in the conditions and in compliance with the obligations stipulated in the Government Decision No.1061/2008 on the transport of hazardous and non-hazardous waste on the Romanian territory and of Law No.. 211/2011 on the regime of waste.

Transport of hazardous expired chemical waste shall be in compliance with Government Decision No.1175/2007 approving the Norms for the road transport of hazardous goods in Romania.

Management of substances classified as expired shall comply with the provisions of Emergency Government Ordinance No.121/2006 on the legal regime of drug precursors and of the applicable European Commission Regulations (273/2004 and 111/2005).

Hazardous waste disposal in amounts exceeding 1 To will require shipment/transport approval of the environmental protection authority of jurisdiction over the service provider site, endorsed by Constanta County Civil Protection, in accordance with the provisions of art. 7 of the Governmental Decision No.1061/2008 on the transport of hazardous and non-hazardous waste on the Romanian territory.

The limits and technical conditions for final RAW disposal shall comply with the norms issued by the National Commission for Nuclear Activity Control and the standards set and approved by the Nuclear and for Radioactive Waste Agency.

The Project Owner may only use the spent nuclear fuel and RAW management processes and methods so as to ensure that all the actions have been taken to provide optimization in radiation protection, in the sense of ensuring that all exposures of the occupationally exposed personnel, the public and the environment, including potential exposures, are maintained at the lowest reasonable possible level, considering the economic and social factors (the ALARA principle), according to the provisions of the Order of the President of the National Commission for Nuclear Activity Control No. 14/2000 approving the Basic Norms for Radiological Safety, as amended.

During operation of units U3 and U4, the Project Owner shall be responsible for ensuring that the activity and volume of spent nuclear fuel and RAW generated are maintained at the lowest possible level.

Radioactive waste management at Cernavodă NPP is conducted in accordance with the national and international RAW management legislation. Direct liability for spent nuclear fuel and RAW management from the operations of NPP. Cernavodă - 4 units, in view of final disposal, belongs to the nuclear license Owner for the lifetime of the nuclear power plant, including during the decommissioning of the nuclear facilities, in accordance with the provisions of the Government Ordinance No.11/2003 on the safe management of radioactive waste, republished and amended, the Order of the National Commission for Nuclear Activity Control No.56/2004 and the standards of the International Atomic Energy Agency (IAEA Safety Series No.111F "The Principles of Radioactive Waste Management").

c4) Management of hazardous substances/mixtures

The provisions of the Law No.360/2003 on the regime of hazardous substances and preparations, as amended, shall be complied with.

The provisions of Government Decision No. 1408/2008 on the classification, packaging and labelling of hazardous substances shall be complied with.

The Project Owner shall know and abide by the provisions of (EC) Regulation No.1907/2006 of the European Parliament as amended, and of the European Parliament and Council Regulation of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC.

c5) Nature protection/ protection of the natural protected areas

The Project Owner shall comply with the recommendations and further biodiversity monitoring under the specific legislation in force in nature protection and the requirements of the Favourable Endorsement No.336/11.09.2012 issued by the Forestry Directorate Constanța of the National Forest Regie ROMSILVA, as custodian of Natura

2000 sites ROSCI 0022 Canaralele Dunării, ROSPA 0002 Allah Bahir-Capidava and ROSPA 0017 Canaralele de la Hârșova.

d) Environmental monitoring plan during technological and commissioning tests (PIF phase) and during commercial operation (operation phase)

d1) *Monitoring of non-radioactive liquid effluents*

Source	Sampling location	Indicators	Comments
Process water	<p><u>For the influent</u> -the Danube, on the intake pipe;</p> <p><u>For the effluent</u> -discharge into the Danube, under the road bridge; -discharge into the DBSC¹ Race II (in special situations).</p>	<p>1. Temperature (warm water discharge channels to the “recovery” HPP);</p> <p>2. Temperature, pH, suspended matter, Total ionic Fe, Ca, Na, hydrazine and lithium hydroxide mixture, RGCC 100;</p> <p>3. Chlorides, Sulphates, CBO₅, Na, Ca, Mg, oil product, free residual chlorine, ethylene glycol;</p> <p>4. Other indicators, identified based on the chemicals used in washing the U3 and U4 circuits, if applicable.</p>	<p>Monitoring, sampling location, frequency and quality indicators established under:</p> <p><u>1. PIF phase:</u> - GD No.1515/2008²; -Protocol to be concluded by Cernavodă NPP and ABADL³ three months before starting the technological tests for U3 and U4; -Protocol to be concluded with ABADL³ three for U1 and U2;</p> <p><u>2.operation phase</u> -Water Management Authorization for Units 3 and 4 of Cernavoda NPP; -Environmental Authorization for Cernavoda NPP - 4 units -Protocol to be concluded between Cernavodă NPP and ABADL³; -Protocol to be concluded between Cernavodă NPP and EPA⁴ Constanta;</p>
Domestic waste water	Monitoring points to be established by ABADL ³ and RAJA ⁵ Constanța	Under GD No. 188/2002, as amended by GD No. 352/2005-NTPA 002	<p>Monitoring, sampling location, frequency and quality indicators to be established under:</p> <p><u>1. PIF phase:</u> -Water Management</p>
Storm	Upstream of	Under GD No.	Endorsement for U 3 and U4;

waters, including from storm water drainage and water stored in the exterior drainage sump	the NPP intake basin inlet e	188/2002, as amended by GD No. 352/2005-NTPA 002	<ul style="list-style-type: none"> - Protocol between Cernavodă NPP and ABADL³ concluded three months before starting the technological tests for U3 and U4. <u>2. operations phase</u> -Water Management Authorization for Units U1-U4 of Cernavoda NPP; -Environmental Authorization for Units U1-U4 of Cernavoda NPP; - Protocol between Cernavodă NPP and ABADL³; - Protocol between Cernavodă NPP and EPA⁴ Constanța
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NB: ¹ DBSC: Danube-Black Sea Canal

² GD No. 1515/ 2008 on issuing the environmental permit for “Nuclearelectrica”-SA National Company - NPP Branch - Unit No.1 and Unit No. 2 of Cernavodă NPP

³ ABADL: Water Basin Management Dobrogea-Black Sea Coast

⁴ EPA: Environmental Protection Agency

⁵ RAJA: County Water Regie Autonome

d2) Monitoring of the Danube temperature in the area of the plume with modified temperature (PIF and commercial operation phases)

Area	Indicators	Comments
Cooling water discharge into the Danube via Seimeni valley and in Race II of the DBSC ¹ (in special situations)	Temperature	Develop a technical options study for the development and implementation of a temperature monitoring programme, considering the recommendations of the adequate assessment study prepared by INCDDD ² Tulcea.

NB: ¹ DBSC: Danube-Black Sea Canal

²INCDDD: National Research & Development Institute “Danube Delta”

d2) Waste monitoring (PIF and commercial operation phases)

a) non-radioactive

Source	Monitoring		

	locations/ frequency	Types	Comments
Current commissioning activities at U3 and U4.	Work areas where investment works take place Permanent frequency	- waste generated from commissioning activities of the site facilities; - recyclable waste; - hazardous waste; - municipal-type waste.	Monitoring and reporting of the waste management records follow the provisions of the Law No.211/2011 and the specific legislation in waste management

b) radioactive

Source	Monitoring locations	Indicators	Comments
Current Activities: Radiological Zone 1 Radiological Zone 2 Radiological Zone 3	- workplaces in the radiological zones - decontamination centre of each unit - DIDR ¹	Quantity generated and/or treated	RAW monitoring programme to be approved by CNCAN under Law No.111/1996 republished.

NB: ¹DIDR: Interim RAW Storage Facility

d4) Radiological environmental monitoring, including of the radioactive liquid and gas effluents

(starting from loading the nuclear fuel into the reactor) to be done according to the requirements of the National Commission for Nuclear Activity Control (CNCAN) as included in the specific authorizations for testing and commissioning, and the operating authorization issued by CNCAN

Sample type	Test type	Sampling points	Comments
Air (atmospheric aerosols and atmospheric deposition)	- global β analyses - γ spectrometry - β spectrometry	There are	Environmental monitoring programme according to: - Basic Norms of Radiological Safety (NSR-01); - Norm for the monitoring of environmental radioactivity

Process wastewater Cooling water Storm water Seepage water Deep groundwater	- global β analyses - γ spectrometry - β spectrometry	established according to the CNCAN requirements included in the specific testing and commissioning authorizations	near a radiological nuclear facility (NSR-22); -Environmental monitoring programme to be approved by CNCAN; <u>1. PIF phase:</u> - Commissioning Authorization for U3 and U4 issued by CNCAN; <u>2.operation phase</u> - Operating Authorization for U3 and U4 issued by CNCAN.
Soil, Sediment	- global β analyses - γ spectrometry - β spectrometry		
Milk, Fish, Meat, Vegetables, Leafy Vegetables, Fruit, Spontaneous vegetation	- global β analyses - γ spectrometry - β spectrometry		

d5) Biodiversity monitoring

- a) monitoring of the mollusc species *Corbicula fluminea* and the species of fish *Alosa immaculata* (P.I.F. phase and commercial operation phase)

Monitored species	Monitoring locations/implementation	Monitored aspects
<i>Corbicula fluminea</i> (Mollusca phylum), invasive species	- the control sample to be collected upstream of the cooling water discharge channel; - samples to be collected from the discharge channel and from the Danube, at regular intervals along the length of the plume with modified temperature ; - minimum three annual samplings; to analyse the thermal regime of the water and the hydrological differentials; 3 year monitoring after the start of the commissioning phase	- the dynamics of pediveliger larvae abundance in the cooling water discharge channel of Cernavodă NPP; - pediveliger larvae distribution area; - abundance of adults in the benthos habitats of the Project area.
<i>Alosa</i>	- conduct study fishing (larvae and young spawn transiting the altered temperature plume area)	- knowledge of the influence of the modified temperature plume on the

<i>immaculata</i> (Pisces) mackerel	simultaneously in the thermally affected and not affected areas; - record the flow speeds and temperatures in the typical sections to know where the highest flow speed rate area is located (where most mackerel larvae will flow) and whether the “warm water plume” phenomenon is or is not present in that area; <u>1. PIF phase:</u> - 1 year monitoring before start of U3 and U4 commissioning. <u>2.operation phase</u> 2 years monitoring after U3 and U4 startof commissioning	migration behaviour of adult mackerel; - knowledge of the behaviour and potential effect on the larvae and early spawn of Danube in the area of the modified temperature plume; -identifying the presence of early spawn Alosa sp. on the Danube bottom in the final part of the modified temperature plume.
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NB: Biodiversity monitoring shall be done by a specialist institute empowered under the law and holding laboratories certified under ISO 17025

b) integrated biodiversity monitoring

Purpose	Indicators	Comments
<u>1. PIF phase:</u> Developing an aquatic and terrestrial biodiversity monitoring programme. <u>2.operations phase</u> Implementation of the aquatic and terrestrial biodiversity monitoring programme.	Survey and monitor the influence of radiological, thermal, physical-chemical, mechanical factors on aquatic and terrestrial organisms.	<u>1. PIF phase:</u> Programme to identify the relevant items required in establishing the effects of operating 4 nuclear units, based on investigations conducted by S.N.N.S.A.-Cernavodă NPP Branch, by integrating monitoring programmes and existing studies Programme to be submitted with the environmental authorization application for Cernavoda NPP - 4 units <u>2.operation phase</u> Integrated interpretation of the monitoring programme results to be done by a specialist institute empowered under the law and holding laboratories certified under ISO 17025

Implementation of the impact mitigation measures and their efficiency shall be monitored on an ongoing basis; if negative effects on the species and habitats for which the conservation objectives were established are recorded, the Project Owner shall submit to the central environmental authority additional impact mitigation measures.

3. During closure, decommissioning, environmental restoration and post-closure

The decommissioning conditions for Units 3 and 4 are provided by the Law No. 111/1996 on the safe deployment, regulation, authorisation and control of nuclear activities, republished as amended, Order of the CNCAN President No. 75/2003 approving the Norms on the specific requirements for quality management systems applied in decommissioning nuclear facilities” (NMC-11) and the Order of CNCAN President No. 275/2005 on approving the Norms for the monitoring of environmental radioactivity near a radiological nuclear facility (NSR-22);

The design lifetime of Units 3 and 4 is 30 years.

Ensuring the nuclear safety during nuclear facility operation as well as during decommissioning and final RAW disposal is a process under continuous improvement and it is the basic principle of the Directive 2009/71/EURATOM of the Council of 25 June 2009 on instituting a Community framework for nuclear safety in nuclear facilities.

At the end of the operation phase, the decommissioning activities for Units 3 and 4 shall be conducted in accordance with the European Union norms and regulations, international and national laws and regulations in the nuclear sector in force.

Nuclear power plant or nuclear reactor decommissioning and dismantling projects are included into Annex I point 2(b) of the Directive 2011/92/EU of the European Parliament and Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, transposed into the national legislation by the Government Decision No. 445/2009 on assessing the impacts of certain public and private projects on the environment, as amended. According to art. 4, para. (1) of Directive 2011/92/EU these types of projects are subject to an environmental impact assessment. Therefore, at the end of the operation phase, Cernavodă NPP shall apply for

an environmental agreement for the decommissioning of Units 3 and 4 under the national environmental legislation in force.

The environmental impact assessment documentation shall identify the measures, conditions, monitoring programme that need to be in place during closure, decommissioning, environmental restoration and post-closure. These requirements are to be included in the environmental agreement issued by the competent environmental authority for the decommissioning of Units 3 and 4 under the national, European and international environmental legislation in force.

V. Information on the Public Participation Process for the Procedure

The Ministry of Environment and Climate Change, as the competent authority for environmental protection, has provided information to the interested public, free access to information and public participation in decision making in the environmental agreement issuance process, as follows:

- all the relevant information on the Project “Continued construction works and completion of Units 3 and 4 at Cernavodă NPP” Constanța County, from the submittal of the environmental agreement application to the decision to issue the environmental agreement, was made available to the public on its website www.mmediu.ro, under the Project section.
- the public/interested public was informed on the decisions of the EIA procedure and the scope evaluation through public notices posted on the website www.mmediu.ro and published in the mass media by "Nuclearelectrica" S.A. National Company (SNN) and the Ministry of Environment and Climate Change (MMSC).
- the public hearings of the EIA Report held under the national and transboundary procedures took place in 2007 as follows: 1 October in Cernavodă, 3 October in Constanța, 5 October in Bucharest, 20 November 2007 in Silistra and Dobrich (Bulgaria). "Nuclearelectrica" S.A. National Company and its experts gave extensive, documented answers to the questions and comments of the attending public.

- answers to public comments/observations on the content of the EIA Report and to the questions asked during the national and transboundary hearings were submitted by the Project Owner on the “Form presenting the solutions to the issues pointed out by the public” as follows:

Annex A- observations/comments of civil organisations Greenpeace, Fundația Terra Mileniul III, Women Against Nuclear Power-movement, No More Nuclear Power-movement, Women For Peace-movement;

Annex B – observations/comments of the public during the public hearings at Cernavodă, Constanța and Bucharest;

Annex C – observations/comments of the public during the public hearings at Silistra and Dobrich (Bulgaria);

Annex D - observations/comments of the public in Austria to the EIA Report.

The document “Form presenting the solutions to the issues pointed out by the public” was published on the website www.mmediu.ro under the Project section, and the answers to the comments were sent to the applicants and the States interested in the Project. In all the cases where the interested public asked for further clarifications and/or more detailed answers, they were forwarded to the civil organisations and no additional comments were received.

- consultations took place between the Romanian and Austrian environmental authorities under art. 5 of the Espoo Convention, in March 2008. During these consultations, after visiting the project site, the Austrian Party requested details on certain information contained in the EIA Report. The topics under discussion related to the current state of the work on Units 3 and 4, the reactor core, seismic risk, reactor containment and nuclear safety assessment. The discussions were attended by representatives of the Ministry of Environment and Climate Change (Ministry of the Environment and Sustainable Development, at the time of the meeting), National Commission for Nuclear Activity Control and “Nuclearelectrica” S.A. National Company as well as Austrian

experts from the Federal Ministry of Agriculture, Environment and Water Management, the Federal Environment Agency and Austrian Institute for Applied Ecology.

- additions to the EIA Report, Report on the Adequate Assessment of the Environmental Impact and final answers to the civil organisations were posted on the website www.mmediu.ro for consultation in July-August 2012, and the civil organisations Greenpeace CEE România, Fundația Terra Mileniul III and Asociația „Gânditorul în Acțiune” in Cernavodă were informed in writing that they can view the additions made by “Nuclearelectrica” S.A. National Company, including the answers to their questions.

- during the EIA procedure, the interested public requested additional information on procedural issues and additional details were requested in regard to the information posted on the website. The Ministry of Environment and Climate Change answered all requests by updating the website and, where necessary, forwarding copies of the requested documents/memos, etc.

- aspects of outstanding interest to the Project, that were detailed by the Project Owner in response to the comments of the interested public/ authorities and contributed to the improvement of the EIA Report were :

a) cooling water supply for the operation of Cernavodă NPP-4 units

(comments of Foundation Terra Mileniul III, Association „Gânditorul în Acțiune” and Greenpeace Organisation);

b) measures proposed in case of terrorist attack (comments of Greenpeace Organisation, Foundation Terra Mileniul III, and the Austrian public);

c) measures related to the risk assessment for severe accident, flood, draught, terrorist attack, earthquake situations (comments of Greenpeace-Austria and the Austrian public);

d) decommissioning techniques and measures during decommissioning works (comments of Foundation Terra Mileniul III, Greenpeace-Austria and the Bulgarian public);

- aspects pointed out by the Association “Gânditorul în Acțiune” and Foundation Terra

Mileniul III on the need to detail the information on potential impacts on water due to the discharge of hot water into the Danube River and potential impacts on flora/fauna in the project impact areas led to additional information being included in the EIA Report prepared in 2007 by the National Research & Development Institute for Environmental Protection - ICIM Bucharest, in the form of the Study on the Adequate Assessment of the Environmental Impact prepared by the National Research & Development Institute “Danube Delta” in Tulcea, an institute holding accreditation for this type of work;

- the decision to issue the environmental agreement was posted on the Project website and published in the mass media by “Nuclearelectrica” SA National Company;

- after the decision on the environmental agreement was posted, the Fundatia “Terra Mileniul III”, Greenpeace EEC Romania and the Association Bankwach Romania and the Association Re.Generation contested the decision. The issues pointed out by the civil organisations were discussed in the central Technical Review Committee meeting in April 2013 that decided to maintain the decision to issue the Environmental Agreement. The interested public was informed in writing of the decision to maintain the issue of the environmental agreement;

- the draft environmental agreement was posted on the website www.mmediu.ro under the Project section.

Outcomes of the Transboundary Procedure:

Under art.6 of the Convention on Environmental Impact Assessment in a Transboundary Context, adopted at Espoo on 25 February 1991, ratified by Law No.22/2001, the final requirements agreed with the 2 States that participated in this procedure included:

A. For Bulgaria:

1. Discharge into Race II of the Danube-Black Sea Canal shall only be based on approval by the “Romanian Waters” National Administration and by the National Administration Dobrogea-Black Sea Coast, with the acceptance of the National Company “Administration of the Navigable Canals” SA, of the County Water Regie

Autonome, by notifying the Public Health Directorate in Constanta and the Environmental Protection Agency Constanta and with the approval of the National Commission for Nuclear Activity Control.

2. After commissioning of Units 3 and 4 of Cernavodă NPP, the central environmental authorities in Romania and Bulgaria shall agree on a common information sharing programme based on the results of radiological monitoring conducted by the two States in the respective regions of the Republic of Bulgaria and Romania. The operator shall cooperate and make the necessary data available.

3. The (quarterly) information exchange programme of the two States shall include relevant information on continuous water and air monitoring results for the above regions.

4. “Nuclearelectrica” S.A.National Company - Cernavodă NPP Branch shall make available to the public on its website, the Annual Environmental Report in Romanian and English to facilitate to the interested public (including to the Bulgarian population in the adjacent cross-border areas), access to information regarding the implementation of environmental protection activities.

B. For Austria

1. The permitting steps of the National Commission for Nuclear Activity Control after the issuance of the Environmental Agreement, and any regulatory documents issued by it shall ensure compliance with all the specific permitting requirements in the nuclear sector, including implementation of the requirements expressed in the Final Opinion from Austria. The technical design project contains improvement measures derived from the assessments made in the context of “stress tests” requested by the European Council and the European Commission, after the Fukushima accident (measures included under Chapter I.2.of this Environmental Agreement).

2. Deep drilling is the alternative option for cooling water supply to the core, in case of loss of cooling sources based on the water taken from the Danube River.

3. The Owner shall ensure that the structural state of the concrete containment and reactor buildings at the start of the building works is suitable for the building, completion, and safe operation of the two units proposed by the Project.
4. The Owner shall implement and manage programs to ensure the reliability of critical nuclear safety and production components, developed under the international requirements.
5. The Project provides the measure to install passive autocatalytic recombiners, required for hydrogen control in the Reactor Buildings (a measure mentioned in Chapter I.2. of this Environmental Agreement).
6. The Projects takes into account the latest requirements of the International Atomic Energy Agency guidelines and the international standards, as required by the National Commission for Nuclear Activity Control.
7. The Projects takes into account the level 2 probabilistic nuclear safety assessment (PSA level 2) that demonstrates compliance with the 10^{-5} event/year target required for the core damage frequency and the 10^{-6} event/year target for the large release frequency from the containment.

In consideration of art. 21 para (1) and (4) of Emergency Government Ordinance No. 195/2005 on environmental protection, as amended and approved by Law no.265/2006, amended, the documentation submitted with the Environmental Agreement application includes:

- Environmental Agreement Application addressed to the Environmental Protection Agency Constanta under No. 6548 RP of 09.08.2006.
- Presentation Report for the issuance of an Environmental Agreement for Cernavodă NPP Units 3 and 4 prepared by CITON-Sucursala de Inginerie Tehnologică Obiective Nucleare (Nuclear Facility Technological Engineering Branch) of the Romanian Authority for Nuclear Activities (June 2006).
- Notification of the potentially affected States (Bulgaria, Austria, Hungary, Moldova and the Ukraine) and the answer regarding participation in the EIA procedure in a

transboundary context sent by Bulgaria and Austria.

- Urbanism Certificates issued by Cernavodă Town: No.165/24.07.2006, No. 240/23.07.2008, No.93/01.06.2012 and No.106/27.06.2012.

- Site Authorisation for a CANDU-PHW 4 x 660 MWe nuclear power plant, on the Cernavodă site issued by the State Committee for Nuclear Energy(1978).

- Environmental Impact Assessment Report titled “Report to the environmental impact assessment for Cernavodă NPP Units 3 and 4” prepared by National de Research and Development Institute for Environmental Protection –ICIM Bucharest (2007) and the additions to the EIA report (2012).

- The adequate assessment study titled “Adequate Assessment of the Environmental Impact of Units 3 and 4 of Cernavodă NPP – Impact on Biodiversity – Final Report” prepared by the National Research & Development Institute “Danube Delta” Tulcea (2012).

- Viewpoint of the Commission of 26.11.2010 in accordance with art. 43 of the Euratom Treaty concerning the completion of Units 3 and 4 of the Nuclear Power Plant of Cernavodă, Romania.

- The report of the probabilistic seismic hazard analysis mission, issued by the International Atomic Energy Agency (July 2012) titled “Report on the 2nd follow up review mission for the probabilistic seismic hazard analysis and development of design basis ground motions for the Cernavoda NPP Units 3&4” .

Comfort letter regarding the licensibility of Units 3 and 4 of Cernavodă NPP No.3487/30.05.2012 - National Commission for Nuclear Activity Control.

- Water Management Endorsement No. 35/2011 for “Nuclear Power Plant Cernavodă Units 3 and 4” Constanta County, issued by the National Administration “Romanian Waters”;

- Water Management Endorsement No. 54/2013 for “Continued Construction Works and Completion of Units 3 and 4 of Cernavodă NPP”, issued by the National Administration “Romanian Waters”;

- Positive endorsement of the custodian of the natural protected areas – Natura 2000 sites in the Project impact area No.3336/11.09.2012 Issued by the National Forests Regie-ROMSILVA–Forestry Directorate Constanța.
- Final opinions from Bulgaria and Austria No. 37033/ED/28.11.2012 and No. 36992/ED/26.11.2012, respectively.
- Governmental Decision No.1565/2008 approving the report on the negotiation of the conditions for the incorporation of the company that shall develop the Units 3 and 4 of Cernavodă NPP.
- site location plans and layout plans;

This Environmental Agreement shall be valid for the whole Project implementation period, under art.16 para (3) of Emergency Government Ordinance No. 195/2005 on environmental protection, as amended by Law no.265/2006, amended.

On completing the execution works, the Project Owner shall notify the central environmental authority in view of performing the checks of compliance with the requirements enforced under this Environmental Agreement and of the Findings Report to be attached to the Works Reception Report for the implemented investment.

Failure to comply with the Environmental Agreement requirements shall trigger suspension or cancellation thereof, as applicable, under art. 17, para.(3), para.(4) and para.(5) of Emergency Government Ordinance No.195/2005 on Environmental Protection, approved and amended by Law No.265/2006, amended.

This Environmental Agreement may be challenged in court under Government Decision No.445/2009 on assessing the environmental impact of certain public and private projects, as amended, and the Law on Administrative Disputes No.554/2004, amended.