

Environmental Impact Assessment Report for Decommissioning of Units 1 to 4 at Kozloduy Nuclear Power Plant



Environmental Impact Assessment Report for Decommissioning of Units 1 to 4 at Kozloduy Nuclear Power Plant



VOLUME 1

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VOLUME 2

Environmental Impact Assessment Report for Decommissioning of Units 1 to 4 at Kozloduy Nuclear Power Plant



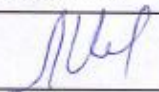


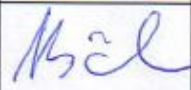
VOLUME 3

Environmental Impact Assessment Report for Decommissioning of Units 1 to 4 at Kozloduy Nuclear Power Plant



VOLUME 4

Environmental Impact Assessment Report for Decommissioning of Units 1 to 4 at Kozloduy Nuclear Power Plant

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Document Handling

Revisions

Revisions of the present document are made by exchange of the complete document including the cover page with signatures. No exchange of individual pages is allowed.

The revision number and the respective release date are indicated at the top of all pages.

Changes with respect to the relevant previous document are marked with a vertical line at the right hand side of the pages.

The reasons for the release of a new revision and/or main modifications in the actual revision and the pages concerned are recorded in the below list of revision.

| Number of revision | Reason/ Main modifications/ Explanations |
|--------------------|--|
| 00 | Initial Document |
| 01 | Based on Client's Comments on Revision 00 |
| 01cor | Revised version 01 based on EBRD and Client Comments on Rev 01 |
| 01.2 | Revised version 01 based on KNPP Safety Council, EBRD and Client Comments on Rev 01cor and MoEW Letter from 09.07.2010 |
| 01.3 | Revision based on Clients Comments on rev.01 at KNPP Safety Council |
| 01.4 | Revised version for integration of the Transboundary aspect assessment, based on the letter of the Romanian Side for participation in the EIA Procedure in Transboundary Context (Chapters A, 1, 3, 4, 7, 9,10. NTS and CAR) |
| 01.5 | Revised version 01.4 based on the Client Comments on the transboundary aspect integration in Revision 01.4 (integral edition of the EIA-R and NTS) |
| 01.6 | Revision based on new revision of the Terms of Reference to define the scope and content of Environmental Impact Assessment of the Investment Proposal – Revision 4A - SE RAW |
| 02 | The present edition of the EIAR is fully entirely revised and supplemented in accordance with MEW Letter ref No OBOC-289/09.01.2013 and based on the EBRD comments on the Non-technical summary. In chapter 7, Table 7.2.1.-2 is given a reference of the accepted and non-accepted remarks, statements, opinions and recommendations being made. The revision from 12 April 2013 – BG version (30 May 2013 – EN version) is subsequent to the MEW Letter ref .№OBOC-289/28.03.2013 – Revised EIAR with removed discrepancies |

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TRANSBOUNDARY ASPECTS OF THE INVESTMENT PROPOSAL

LIST OF ABBREVIATIONS

| | |
|-----------|---|
| AB | Auxiliary Building |
| AAPC | Annual Average Permissible Concentration |
| AC | Alternating Current |
| a.d.w | Air-dry weight |
| AER | Atomenergoremont PLC |
| AISERC | Automated Information System for External Radiation Control |
| ALARA | As Low As Reasonably Achievable |
| ALS | Accident Localization System |
| AMS (AMC) | Automated Meteorological Station |
| AOX | Absorbable Organic Halogens |
| ASAP | Automated system for aerologic probing |
| BAB | Basic Auxiliary Building |
| BAS | Bulgarian Academy of Science |
| BCP | Boron Concentrate Pump |
| BDS | Bulgarian State Standard |
| BNRP | Basic Norms on Radiation Protection |
| BOD | Biological Oxygen Demand |
| BPS | River Bank Pump Station |
| BULRaMo | National Automated System for Permanent Control of the Gamma-radiation Background |
| CA | Controlled Area |
| CAS | Condenser Sump |
| CC | Cold Channel |
| CED | Collective Effective Dose |
| CM | Council of Ministers |
| COD | Chemical Oxygen Demand |
| CP | Cooling Pump |
| CPS | Circulation Pump Station |
| CR | Control Room |
| CS | Controlled Shaft |
| DC | Drainage Channel |
| DC Panel | Direct Current Panel |
| DCM | Decree of Council of Ministers |
| DCP | Drainage Condensate Pump |

| | |
|---------------|---|
| DeManS | Decommissioning management system |
| DF | Decontamination Factor |
| DG | Diesel Generator |
| DGS | Diesel Generator Station |
| DRTD | Disease Rate with Temporary Disability |
| DSAR | Decommissioning Safety Analysis Report |
| DSFS | Dry Spent Fuel Storage |
| DSS | Decay Storage Site for Transitional RAW |
| DT | Drainage Tank |
| DW | Demineralized Water |
| DWF | Demineralized Water Facility (also WDF – water demineralization facility) |
| EBIT | Emergency Boron Injection Tank |
| EBRD | European Bank for Reconstruction and Development |
| ECT | Evaporator Concentrate (Bottoms) Tank |
| EDF | Electricité de France |
| EEA | Environmental Executive Agency |
| EEIR | EWN Environmental Impact Register |
| EFWP | Emergency Feed Water Pump |
| EIA | Environmental Impact Assessment |
| EIAR | Environment Impact Assessment Report |
| EMC | Electromechanical Counter |
| EMF | Electromagnetic Fields |
| EP | Electricity Production |
| EP -1, EP - 2 | Electricity production 1; Electricity production 2 |
| EPA | Environment Protect Act |
| EPC | Environmental Protection Committee |
| ERC | Environmental Radiation Control (Department) |
| ERM | Environmental Radiological Monitoring (former RREC) |
| EU | European Union |
| EWN | EnergieWerke Nord |
| EWST | Emergency Water Storage Tank |
| FAIV | Fast acting Isolation Valve |
| FMR | Financial and Material Resources |
| FRMF | Free Release Measurement Facility |
| FW | Feed Water |

| | |
|-----------|---|
| FWP | Feed Water Pump |
| GCF | Gas Cooling Filter |
| GHG | Green House Gases |
| GOCP | Gas Oil Cooling Pump |
| GOCS | Gas Oil Cooling System |
| GPS | Gas Purification System from Radioisotopes |
| GSSS | Generator Shaft Sealing System |
| HAST | High Activity Sorbents Tank |
| HC | Hot Channel |
| HELCOM | Helsinki Convention for the Protection of the Baltic Sea |
| HPC | High pressure Cylinder |
| I&C | Instrumentation & Control |
| IAEA | International Atomic Energy Agency |
| IAEA | International Atomic Energy Agency |
| ICPDR | International Convention for the Protection of the Danube River |
| IDCC | Individual Dosimetric Control Centre |
| IHNRM | In-house Non Radiation Monitoring |
| IP | Investment Proposal |
| JVC | Jet Vortex Condenser |
| KGR | Greifswald NPP |
| KNPP | Kozloduy Nuclear Power Plant |
| LAST | Low Activity Sorbents Tank |
| LCH | Law on the Cultural Heritage |
| LHC | Low Head Channel |
| LLA | Long Lived Aerosols |
| LMS | Local Monitoring Station |
| LOCA | Loss of Coolant Accident |
| LPC | Low Pressure Cylinder |
| LPH | Low Pressure Pre-heater |
| LRAW | Liquid RAW |
| LSMN | Local Seismological Monitoring Network |
| LST | Lubricant Surge Tank |
| LSU | Litostratigraphic Units |
| MA (SZ) | Monitored Area (Surveillance Zone) |
| MAFI | Ministry of Agriculture and Food Industry |
| MB | Main Building (Reactor Building) |
| MCP | Main Coolant Pump |
| MCR | Main Control Room |
| MCsP | Main Coolant Pipeline |
| MDA (LLD) | Minimum Detectable Activity (Lower level detectable) (also MPA) |

| | |
|-----------|---|
| MDC (MDH) | Main Drainage Channel |
| MEE | Ministry of Economy and Energy |
| MEUR | Million EUR |
| MH | Ministry of Health |
| MIV | Main Isolation Valve |
| MEW | Ministry of Environment and Water |
| MPC | Maximum Permissible Concentration (also MAC/Maximum allowable concentration) |
| MPL m. e | Monthly Single Maximum Permissible Limit |
| MRDPW | Ministry of Regional Development and Public Works |
| MS | Monitoring Shaft |
| MSH | Main Steam Header |
| MSK | Medvedev Sponheuer Karnik Seismic Scale |
| MSV | Main Steam Valve |
| NAEMS | National Automatic Environmental Monitoring System |
| NCRBRP | National Centre for Radiobiology and Radiation Protection |
| NDF | National Disposal Facility for Low and Intermediate Level Short Lived Radioactive Waste |
| NICM | National Institute for Cultural Monuments |
| NIMH-BAS | National Institute on Meteorology and Hydrology to BAS |
| NIPNCV | National Institute for Protection of Immovable Cultural Values |
| NPP | Nuclear Power Plant |
| NRA | National Regulatory Authority |
| NRRPC | National Centre for Radiobiology and Radiation Protection |
| NSSS | Nuclear Steam Supply System |
| OC | Oil Cooler |
| OCBP | Oil Cooling Buster Pump |
| OS | Oil System |
| OSC | Oil Seal Cooler |
| PA | Protected Area |
| PAZ | Precautionary Action Zone |
| PCL | Permissible Concentration Limit |
| PDS | Pre-decommissioning Stage |
| PMF | Plasma Melting Facility |
| PT | Protected Territory |
| RAM | Radioactive Materials |
| RAW | Radioactive Waste |
| RB | Reactor Building |
| RCC | Reinforced Concrete Containers |
| RCI | Reducing Cooling Device |
| RCMIW | Repository for Conventional Municipal and Industrial Waste |

| | |
|---------------------|--|
| RES | Facility for Retrieval and Stabilization of Spent Ion Exchange Resins |
| RFS | Reactor Final Shutdown |
| RH | Reactor hall |
| RHS | Residential and Hygiene Sewage Drainage System (also Sanitary Sewage System) |
| RIEW | Regional Inspection for Environment and Waters |
| RloEW | Regional Inspectorate of Environment and Water |
| RISA | Research Institute of Soil Science and Agro ecology |
| RM | Radiation Monitoring |
| RNG | Radioactive Noble Gas |
| RPA | Radiation Protection Area |
| RPV | Reactor Pressure Vessel |
| RWT | Facility for Treatment and Conditioning of Solid RAW with High Volume Reduction Factor |
| SAR | Safety Analysis Report |
| SB | Sanitary Building |
| SCC | Secondary Condense Cooler |
| SCH | Stator Cooling Heat Exchanger |
| SCP | Stator Cooling Pump |
| SCS | Structures, Components and Systems |
| SE | Safe enclosure |
| SE "RAW" (SERAW) | State Owned Enterprise "Radioactive Waste" |
| SFP | Spent Fuel Pool |
| SFS | Spent Fuel Storage |
| SG | Steam Generator |
| SGC | Steam Generator Compartments |
| SLA | Short Lived Aerosols |
| SNF | Spent Nuclear Fuel |
| SNFSF | Spent Nuclear Fuel Storage Facility |
| SO | Solved Oxygen |
| SPA | Sanitary Protection Area (also HPA – Hygiene Protection Area) |
| SRDW | Size Reduction and Decontamination Workshop |
| SS | Shift Supervisor |
| SSE | Sealing Steam Ejector |
| ST | Start-up Transformer |
| SW | Shaft Well (also IIIIC) |
| SWD | Site for Conventional Waste from Decommissioning |
| SWP | Service Water Pump |
| SWT | Special Water Treatment (also SVO) |
| TC | Transport Corridor |

| | |
|------|--|
| TCC | Technical Condensate Cooler |
| TCC | Trapezoid Cross-section Channel |
| TG | Turbo-generator |
| TH | Turbine Hall |
| TLD | Thermo-Luminescent Dosimeter |
| TLV | Threshold Limit Value |
| ToR | Terms of Reference |
| TPP | Thermal Power Plant |
| U | Uranium |
| UWB | Groundwater Body |
| VC | Ventilation Centre |
| VOC | Volatile Organic Compound |
| VS | Ventilation Stack |
| WPP | Water Power Plant |
| WTS | Waste Treatment System |
| WWER | Water-cooled Water-moderated Energetic Reactor |