MINISTRY OF ENVIRONMENT AND FORESTS
NATIONAL ENVIRONMENTAL PROTECTION AGENCY

ARPM Bucharest
Logo

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No. 243,3094/09.03.2007

ENVIRONMENTAL AGREEMENT

No. 1 of 09.03.2007

Following to the request submitted by "HORIA HULUBEI" NATIONAL INSTITUTE FOR RESEARCH & DEVELOPMENT IN PHYSICS AND NUCLEAR ENGINEERING - IFIN-HH Bucharest, head office: Magurele Town, 407 Atomistilor Street, Ilfov County, registered at A.R.P.M Bucharest with no. 243/15.09.2004 with subsequent completions submitted with no. 3094/22.06.2006,

following the analysis of the documents submitted and the verification,

pursuant to the Government Decision no. 408/2004, on the organization and functioning of the Ministry of Environment and Water Management, with subsequent changes and completions, and the Emergency Ordinance no. 195/2005 on environmental protection, approved and modified by Law no. 265/2006,

is issued this:

ENVIRONMENTAL AGREEMENT

for:

"HORIA HULUBEI" NATIONAL INSTITUTE FOR RESEARCH & DEVELOPMENT IN PHYSICS AND NUCLEAR INGENEERING – IFIN-HH Bucharest, head office in Magurele Town, Ilfov County,

aiming to provide:

"The decommissioning of VVR-S nuclear reactor and the modernization of STDR and DNDR installations for the treatment, conditioning and disposal of radioactive waste resulted from decommissioning"

from IFIN-HH site, Bucharest, Ilfov County, Magurele Town, 407 Atomistilor Street (strip ground no. 61, land plot no. 206).

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I. Preparatory works necessary for the decommissioning operation

Before starting the preparatory works, the reactor hall will be cleared of all research and isotopes production equipment.

Preparatory works will consist of:

- arrangement of the locker rooms (differentiated by sexes) in the current sanitary airlock;
- arrangement of a special airlock (with 2 systems for measuring the contamination) at the basement, for works with high contamination risk;
- decontamination of the reactor enclosure (reactor hall, pumps room, vacuum pumps room for technological air sampling as part of the dosimetry department, preparatory room, hot cells, setter for the air flow from the ventilation system, washing solutions room, sanitary airlock and underground corridor) with potentially high contamination which will become the work enclosure during the decommissioning works;
- arrangement of a radiological characterization laboratory in the reactor hall;
- arrangement of an airlock for industrial and radioactive waste in the reactor hall corridor;
- arrangement of the cutting workshop in the reactor hall: sheet enclosure on metallic scaffold, ventilation maintained depressed with HEPA filters, local dosimetry monitoring, power supply circuit, compressed air, cooling systems in closed circuit;
- arrangement of characterization spaces, packaging, disposal, storing in radioactive waste containers with control and recording points;
- mending the reactor hall ceiling and the windows, painting the walls and floors with epoxy paint (after decontamination), mounting metallic doors with airtight system at the access to the Reactor Hall.
- arrangement of spaces in the labs building for the surveillance of the decommissioning activities (command and surveillance room, operations coordination, emergency interventions, bureau for classified documents);

II. Decommissioning works

The decommissioning of the reactor will be carried out in 3 consecutive stages, with a total duration of the investment achievement of 16 years and 2 months.

Types of works carried out in the 3 stages: dismantling, removal, cutting, decontamination, scarifying, treatment, evaporation, conditioning (cementation), long term storage, disposal, classic storage.

Stage 1 (duration: 2 years and 2 months):

The reactor is permanently shut-down and systematically monitored; fresh nuclear fuel was transferred under safeguards to SCN Pitesti; no dismantling or removal activities of nuclear reactor's components are carried out.

- transfer of spent nuclear fuel from DC – reactor hall to DCNU;
- studying the archives containing operation documents, reconstitution of the technical documentation related to the reactor (from its commissioning until up to date)

- radiological characterization of all buildings, equipment and installations related to the nuclear reactor (technological ventilation plant, underground tank with V=30 m^3, DFU, underground piping system);
- elaboration of the documentation and technical projects associated to the work enclosure construction for the activities in decommissioning stage 2;
- obtaining the authorizations from the regulatory bodies;
- arrangement of the work enclosure;
- purchase of instruments, equipment and tools for decommissioning activities;
- carrying out works for the rehabilitation and preparation of STDR (outfitting with decontamination installation, concrete-pumping, fire detection and alarm system) and DNDR (access road rehabilitation) for processing the waste resulted from decommissioning stage 2 and disposal of radioactive waste.
- the following systems remain functional: biological protection systems, dosimetric control, power supply, pumps, valves, primary circuit filter, radioactive drainage system, distilled water circuit, ventilation system, lifting systems.
- the secondary system is rehabilitated and adapted to the decommissioning requirements of the reactor.

Stage 2 (duration: 4 years):

Decommissioning works for which exist the authorized capacities of treatment and management of radioactive waste are carried out; spent nuclear fuel is evacuated from the reactor hall.

- decontamination, dismantling, demolishing, treatment and conditioning of radioactive waste, with gradual withdrawal of surfaces, volumes, equipments towards the area occupied only by the reactor hall, hot cells and the cooling pond;
- decommissioning of the primary circuit, secondary circuit and mixed bed filter;
- clean-up and decontamination of hot cells;
- elaboration of the documentation and technical projects for completing the work enclosure construction, necessary for carrying out operations in decommissioning stage 3;
- obtaining the related authorizations from the regulatory authorities;
- completion of the work enclosure construction;
- purchase of instruments, equipment and tools for stage 3 decommissioning activities;

The following systems will remain functional: lighting, technological ventilation, instrumentation and control-monitoring system, physical protection, distilled water system, lifting equipment, DCNU, DFU, STDR, DNDR.

After this stage, the nuclear objective has not yet reached the levels to be released from CNCAN license requirements.

Stage 3 (duration: 10 years):

- decommissioning of the reactor block, de-aerator, hot cells and the other installations in the reactor basement;

- decommissioning of the underground tank (V=30 m^3), the technological ventilation plant (except the dissipation stack), the compressed air network;
- developing an expertise of DFU for use (on long term)/ decommissioning;
- decommissioning the mechanical workshop in the reactor hall;
- evacuating the equipment, tools and materials used for decommissioning;
- final decontamination of the reactor building;
- demolishing the reactor hall and the reactor basement;
- mending the front of the laboratories building;
- bringing the reactor hall site at lands elevation and grass-covering;
- waste management and evacuation resulted from last decommissioning phase;
- total radiological control for confirming under the release from the licensing regime;

In this phase VVR-S reactor is brought to the level of clearance from CNCAN license requirements.

III. Materials used for decommissioning and site rehabilitation:

- vessels for the transportation and final storage of radioactive waste (metallic drums with removable lid): 8000 pcs. (1000 in Stage 2 and 7000 in Stage 3):

a) with capacity V= 220 dm^3, used for low and medium activity waste;
b) with capacity V= 420 dm^3, with concrete biological protection, for damaged small drums or higher activity waste.

- vacuum cleaners and local suction systems fitted with HEPA filters;
- tools and cutting devices (with plasma, electric arc, concrete brazing, air-powered tools, etc. with sizes of maximum 40x40x40 cm);
- consumables for tools and devices (vacuum cleaner bags, filters, brazing blade, etc.) textiles, plastic bags, materials of construction, etc.

IV. Measures, equipment and protection conditions:

1. The sanitary airlock will be fitted with 2 contamination measuring systems: ”dirty” area for measuring hands-legs contamination and at the exit of the ”clean” area , for measuring the contamination of the entire body.

At the entrance of the area with high contamination will be placed a personnel register box-office and everybody will receive an electronic dosimeter initialized at the entrance, then read and registered at the exit.

2. An airlock in the corridor at the ground floor of the reactor hall is arranged for the radioactive waste.
3. The cutting workshop will be set up in the reactor hall as a sealed enclosure provided with corridor for persons and materials, ventilation by low air-pressure, dosimetry monitoring system, mobile HEPA filtered ventilation system, closed-circuit cooling system with recovery of the powders from the filters.

4. The reactor hall will be set up in dedicated areas: mechanic dismantling of equipment, radiological characterization, area for the disposal/storage of containers for transfer to STDR.
5. The access of personnel into the building will be done only by general airlock.
6. The access to the area with potentially high contamination will be made by the airlock from the basement.
7. All doors will be provided with self-closing device.
8. Interim storage of radioactive waste and waste resulted from the reactor decontamination/ demolishing for the transfer to the disposal location will be made at DCNU.
9. The personnel carrying out activities in the controlled and surveillance area will be trained on specific norms on labor protection.
10. A personnel radiation protection program will be elaborated and the stationary time of the personnel handling radioactive waste in the controlled area will be limited at 100h.
11. The personnel involved in radioactive waste handling operations will wear protection equipment (disposable overalls with hood, mask, gloves, protecting glasses) and individual monitoring means.
12. The systematic individual monitoring of the entire professionally exposed personnel will be ensured as well as all the persons subject to accidental or emergency exposure.

with the purpose of:

- progressive and systematic reduction of radiological hazard;
- limiting radiations exposure of personnel, population and objectives near the site;
- ensuring the environmental protection all throughout the nuclear reactor decommissioning process;
- release of the nuclear objective from CNCAN licensing requirements;
- bringing the nuclear reactor hall area to its initial state;
- disposal of radioactive waste resulted from decommissioning within DNDR Baita, Bihor county.

under the following conditions:

The decommissioning works will be carried out according to the provisions of Law no. 111/1996 regarding the safe deployment of nuclear activities, republished with further modifications and completions.

The norms regarding the limitation of the radioactive effluents discharges to the environment, approved by CNCAN Order No. 221/2005, will be complied with all throughout the works.

Works will be carried out in stages, according to the project, so that the impact generated would have a smaller amplitude.
During the decommissioning the following aspects will be taken into account:
- avoid the spread or loss of materials during the decommissioning or transportation;
- taking all the specific measures for personnel and population radiological protection;
- environment radioactivity monitoring during the deployment and after the completion of the decommissioning works.

Polutants sources and enviromnental factors protection

1. Water quality protection
Radioactive liquid effluents resulting from nuclear reactor decommissioning: fuel ponds, reactor vessel, reactor components decontamination (primary circuit, reactor vessel, de-aerator, HC), secondary decommissioning of materials resulted form decommissioning, radioactive leakage drainage system, underground tank, active drainage system, will be considered "liquid radioactive waste" and will be treated at STDR IFIN-HH or STDR Pitesti.
Domestic waste waters, industrial waters and rain waters will be collected into the sewerage system of the Reactor-Group 1 enclosure within IFIN-HH and will be discharged in Magurele Town sewerage administrated by SC VITAL GAZ SA.

2. Air quality protection
Radioactive aerosols emissions resulted from decommissioning operations (dismantling, cutting, etc.) of activated materials and/or contaminated and of decontamination operations will be collected and spread by the technological ventilation system or mobile ventilation systems, provided with suction opening, hose connection and HEPA filters.
Admissible concentration of radioactive substances in the atmosphere of the work area regulated by labor protection legislation will be met.
At the site limit will be met the air quality conditions provided by STAS 12574/1987.

3. Soil protection.
In order to avoid soil and subsoil pollution by used substances, materials or waste, the specific procedures regarding their collection, handling, storage and management will be met.
Radioactive waste relocation operations will take place within the reactor hall enclosure, transport to STDR.
During the decommissioning operations will be avoided:
- damaging the radioactive materials packages;
- radioactive materials discharges and spreads on soil;

- storing the waste resulted from decommissioning/decontamination directly on soil.

In case of a soil accidental contamination with radioactive materials, the area will be marked, decontamination will be done and the waste will be packed and shipped together with the radioactive waste, at the disposal place.

4. Noise

During the reactor decommissioning operations equipments that meet the norms on labor protection in force will be used and all measures for meeting the admissible limits of noise level provided by STAS 10009/88: 65 $dB_{(A)}$, on Noise curve 60, at the limit of Group I- Reactor enclosure within IFIN-HH will be taken.

5. Waste management

Between the permanent shut-down of the reactor and the proper decommissioning, components activated by neutrons (vertical channels, reactor vessel, steel and concrete shielding, thermal column, cast iron plug, cabinet, lining, horizontal channels) and waste from contaminated area (primary circuit, hot cells, primary circuit pumps room, isotopes transfer area, technological areas, ventilation system) become low and medium active waste by successive decay and nuclear transmutation and/or decontamination.

The waste on the site and those resulted from the reactor decommissioning operations will be managed according to the G O No. 11/2003 on the management of spent nuclear fuel and radioactive waste, including final disposal, approved by Law No. 320/2003 and modified by Law No. 320/2003 and modified by G O No. 31/2006 complying with the fundamental norms on safe management of radioactive waste approved by CNCAN Order no. 56/2004.

5.1. Waste on the site:

There are 223 spent (used) nuclear fuel assemblies on the site:

- 153 assemblies with type EK10 fuel containing UO_2 enriched with 10% U^{235} disposed in Mg matrix encapsulated in Al.
- 70 assemblies with type S36 fuel containing UO_2 enriched with 36,36% U^{235}n spread and encapsulated in AL.

SPF assemblies are stored in DCNU, except the last recharge of the Nuclear Reactor (S36 type fuel) located in the CP within the reactor hall,

In stage 1, SPF from CP will be transferred for interim storage at DCNU. Removing CNU from the site – by transfer in 3 stages to the supplier country- is the condition for starting stage 3 decommissioning works.

Inside the storage channels A, B, D1±D6, 2, 5, 6, from the reactor block are stored a series of devices (waste) for which a spectrometric γ analyze was made, and identifying thus the contained radioisotopes with dose/ contact which varies between 0,020 mR/h and7,700 R/h: 11 ionizing rooms, 3 irradiation channels, 3 steel rods,

aluminium, duraluminium, 3 irradiation loops, 2 aluminium blocks, lift, adjustment rods, thermocouple device, assemblies substitutes, iridium pellets.
All these will be dismantled, decontaminated, cut and depending on the activity, conditioned (cemented) within STDR and stored for long term or disposed within DNDR.
5.2.Waste resulted from decontamination operations, remaking of interior finishing:
Decontamination will be made by:
- aerosols and radioactive dust aspiration;
- washing with water, detergents;
- treatment with complexing agents, alkali, mineral acids, acids mixtures, solutions of natural mixtures of contaminated isotopes;
- immersing, cleaning, scraping, polishing, removing the surface;
- burning in controlled volume, breakage (chemical or mechanical)

As consequence to the primary circuit, reactor vessel, de-aerator, KIP cabinet decontamination (including connecting pipes) and remaking of finishing will result:

No.	Material (classification) *)	Mass [t]	Radionuclides resulted from contamination	B, γ [Bq/cm^2.s] contamination, Dose rate [mSv/h]
Stage 2				
1	Water + decontamination solution (LILW-SL)	211,8	Cs^{134}<140Bq/l, Co^{60}>250Bq/l	
Stage 3				
2	Water + decontamination solution (LILW-SL)	64	Cs^{134}<200Bq/l, Zn^{65}<80Bq/l	
4	Linoleum, B, (LILW-SL)	36	Cs^{134}, Co^{60} + other radionuclides	<50, <9,35 E0

Liquid effluents resulted from decontamination, washings will be treated by STDR (with a mobile installation) or STDR Pitesti.
From the decontamination operations will result:
- dust and debris from concrete;
- paper waste and contaminated textiles (vacuum cleaner bags, used cleaning rags);
- contaminated individual protection equipments.

These wastes will be measured, and their radiological activity level will established, they will be put into containers, conditioned within STDR, registered, interim stored at DCNU and disposed at DNDR, together with radioactive waste.
5.3.Waste resulted from decommissioning operations

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There are 3 categories of waste: solid (combustible and non combustible, compactable and non compactable, scarifying, etc.), liquid (existing or generated by decontamination) and gaseous (aerosols, dust particles).
Estimated quantities [kg] of materials resulted from decommissioning:

Material	Stage 1	Stage 2	Stage 3	Total
Water	20 000	211 800	64 000	295 800
Ferrous metals	2 050	47 525	251 739	301 314
Al	-	815	6 414	7 228
Concrete	-	51 100	126 560	177 660
Graphite	-	-	4 711	4 711
Resin + active carbon	157		22	179
Metallic waste, paper, plastic, glass, tools	1 200	1 800	-	3 000

Types of waste generated in all 3 decommissioning stages:

No.	Material (classification) *)	Radionuclides resulted from contamination	B, γ [Bq/cm^2.s] contamination, Dose rate [mSv/h]
0	1	3	4
Stage 1			
1	Water (LILW-SL)	Cs^{137}<200Bq/l, Zn^{65}<80Bq/l	
2	El. Wiring Cu + plastic (LILW-SL)	Unknown characterization	
3	Electromechanical components	-	
4	SST, resin, active carbon (LILW-SL)	Cs^{134}, Co^{60}	<10, <1,1 E-1
Stage 2			
5	Sources, metallic waste, paper, plastic, tools (LILW-SL)	Na^{24}, Cr^{51}, Fe^{59}, Sc^{46}, Co^{60}, Cs^{134}, Ba^{133}, La^{140}, Zn^{65}, Ni^{63}, Sr^{90}, Cs^{137}	
6	SST (LILW-SL)	Unknown characterization	<138, <6,9 E0
7	Al (LILW-SL)	Cs^{134}, Co^{60}	<5 (partially activated)

0	1	3	4
8	SST, resin, active carbon (LILW-SL)	Cs^{134}, Co^{60}	<10, <1,1 E-1
9	SST, CS, Cu (LILW-SL, EW)	Cs^{134}, Co^{60}	<350, <1,1 E0
10	Cast iron/ CS (LILW-SL, EW)	Cs^{134}, Co^{60}	
11	CS, Cu, plastic (LILW-SL, EW)	Cs^{134}, Co^{60}	<0,91, <2,3 E-1
12	CS, Cu, plastic (LILW-SL, EW)	Cs^{134}, Co^{60}	<0,67, <4,6 E-1
13	CS, Cu, plastic (LILW-SL, EW)	Cs^{134}, Co^{60}	<0,39, <1,3 E-1
14	CS, Cu, plastic (EW)	-	
15	B (LILW-SL)	Cs^{134}, Co^{60}	<50, <3,2 E-1
Stage 3			
16	Al (LILW-LL)	Cs^{137}, Zn^{65}	
17	Al (LILW-LL)	Unknown characterization	
18	Al (LILW-LL, EW)	Cs^{137}, Zn^{65}	
19	Cast iron (LILW-LL)	Unknown characterization	
20	Cast iron (LILW-SL)	Cs^{137}, Zn^{65}	
21	SST (LILW-LL, EW)	Cs^{137}, Zn^{65}	
22	SST (LILW-LL, LILW-SL EW)	Unknown characterization	
23	SST, CS (LILW-SL)	Unknown characterization	
24	SST (LILW-SL, EW)	Unknown characterization	
25	SST, CS, plastic, glass (LILW-SL, EW)	Unknown characterization	
26	Cast iron, SST (LILW-SL, EW)	Unknown characterization	
27	Cast iron, Al, graphite (LILW-LL, LILW-SL EW)	Unknown characterization	

28	SST, Cu, plastic (LILW-SL EW)	Unknown characterization	
29	C , heavy C (LILW-SL, EW)	Unknown characterization	

*) According to AIEA classification

Liquid radioactive waste will be treated at STDR (with a mobile installation) or at STDR Pitesti by one of the following methods: dilution, evaporation, concentration, ion exchange. The concentrates resulted from treatment will be conditioned by concrete-pumping in shipping containers (drums) and disposed at DNDR.

Solid radioactive waste will be collected in the special dedicated place in the reactor hall, into standard containers (steel drums with detachable lid). The activity of the waste introduced into each container will not exceed the limits allowed by the norms in force and the rate exposure at the wall will not exceed 2mSv/h.

Gaseous radioactive waste will be collected by the technological ventilation system with evacuation by the dispersion stack (H=40 m, Ø=2m) and by the mobile ventilation systems (during the dismantling, disassembling, cutting operations) with local evacuation after filtering.

The processing of the waste contains:

- primary decontamination;
- cutting in the machine shop from the Reactor Hall;
- transfer to STDR;
- conditioning by embedding and insertion into shielded transport recipients;
- transport, control, recording and disposal at DNDR.

Excepted waste:

Stage 1 and 2: - electromechanical components on the control panel of the active core: 1.5 t;

- SST, Cu, plastic resulted from the valve actuating mechanisms: 0,25 t

• metallic waste – code 170405 - released from CNCAN license requirements will be sold through an authorized society for collecting and recycling society ;

• concrete debris - code 170107 - released from CNCAN license requirements will be discharged in an inert waste repository;

Debris and solid waste with activity higher than 1 Bq/g will be disposed, with CNCAN approval, at the National Repository at Baita Mine, Bihor county.

Transport of radioactive materials on Magurele – Baita route, Bihor county will be made with vehicles authorized by CNCAN.

6. Monitoring:

During the Nuclear Reactor decommissioning process, individual radiation doses, working areas, environmental factors such as soil, water, air in the IFIN-HH influence area will be “off-line” and “on-line” monitored (by 14 Canberra Network automatic

stations), according to CNCAN norms regarding the monitoring of environmental radioactivity around nuclear or radiological facilities, approved by CNCAN Order No. 275/2005.
Additionally will be monitored the sediments, vegetation and food supplies, average radioactivity: (analysis of pollutant radionuclides by global beta and gamma methods and gamma spectrometry).

Monitored factor	Monitored point	Frequency	Points no.	Analysis type
Wastewater[3)]	Reactor channels 1 and 2, IFA	daily	2	Global β, global γ
	decanter	yearly	1	γ spectrometry
Surface water[2)]	Ciorogarla downstream and upstream	daily	2	Global β, global γ
		yearly		γ spectrometry
Waste and pluvial water[3)]	Wastewater treatment plant	monthly	2	Global β, global γ
		yearly	1	γ spectrometry
Underground water[1)]	Fountains, observation drillings	monthly	18	Global β, global γ
		yearly		γ spectrometry
Drinking water[1)]	Distribution network	monthly	2	Global β, global γ
		yearly		γ spectrometry
Surface and domestic waste water sediment[4)]	Ciorogarla, discharge channels	Every 2 months	4	Global β, global γ
		yearly		γ spectrometry
Aerosols	IFIN enclosure	By-monthly	1	Global β, global γ
Sedimentable dusts[4)]	IFIN enclosure	monthly	1	Global β
		yearly		γ spectrometry
Uncultivated soil, spontaneous vegetation [4)]	Forest	monthly	9	Global β, global γ
		yearly		γ spectrometry
Cultivated vegetation [4)]	SSE, VNV	yearly	9	Global β, global γ, γ spectrometry
Milk (cow) [1)]		quarterly	1	Global β, global γ, γ spectrometry

[1)] Global β: max. 1Bq/l, global γ: max.0,1 bq/l;
[2)] Global β: alert threshold 1,85 Bq/l,
[3)] yearly discharge limit: Cs^{137}=4x10^8Bq, Co^{60}=1,4x10^8Bq.
[4)] exclusion levels: Co^{60}=1000 Bq/kg, Cs^{137}=800 Bq/kg, U^{238}=200 Bq/kg, Am^{241}=50 Bq/kg, Pb^{212}= 2000 Bq/kg, K^{40}= 2000 Bq/kg.

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After concluding site decommissioning and mending operations will be determined the activity level: release limit: $\Sigma(Th^{232}+Ra^{226})= 0,2$ Bq/g.
Results of the monitoring, for all environmental factors, will be sent to A.R.P.M Bucuresti, at the end of each stage and after completing the works.

The documentation which was at the basis of issuing the environmental agreement contains:

- The data sheet and technical brief, drawn up by the Subsidiary of Technology and Engineering for Nuclear Projects within the AUTONOMOUS AUTHORITY for NUCLEAR ACTIVITIES.
- Environmental impact assessment study report drawn up by RESEARCH AND DEVELOPMENT NATIONAL INSTITUTE FOR METALS AND RADIOACTIVE RESOURCES – ICPMRR.
- Environmental Balance Sheet II and Environmental reports synthesis on the radioactivity in IFIN-HH influence area during 2003-2005 drawn up by Research and development national institute for metals and radioactive resources – ICPMRR.
- Environmental report on the radioactivity in IFIN-HH influence area during January-December 2003 drawn up by DFVM – IFIN-HH Bucharest
- Environmental report on the radioactivity in IFIN-HH influence area during January-December 2004 drawn up by DFVM – IFIN-HH Bucharest
- Environmental report on the radioactivity in IFIN-HH influence area during January-December 2005 drawn up by DFVM – IFIN-HH Bucharest
- Intervention plan for radiological emergency situations at VVR-S Nuclear Reactor drawn up by IFIN-HH Bucharest

and the following permits issued by other authorities:

- Town planning certificate no. 74/02.03.2007 issued by Magurele city hall - Ilfov County
- GD no. 1309/1996 on establishing IFIN-HH Bucharest
- Environmental authorization no. 1827/RV/2003 on the operation of the National Repository for low and intermediate level Radioactive Waste belonging to IFIN-HH Bucharest from Baita village, Bihor county issued by APM Bihor
- Sanitary permit No. 1388/2007, issued by Radiation Hygiene Laboratory within the Public Health Directorate of the Bucharest municipality.
- Authorization for the deployment of activities in the nuclear field No. IFIN-HH/R-01/2005 – for the PRESERVATION OF VVR-S RESEARCH REACTOR issued by CNCAN.
- Authorization for the quality management system in the nuclear field No. IFIN-HH/R-01/2004 - for the PRESERVATION OF VVR-S RESEARCH REACTOR issued by CNCAN.
- Authorization for the deployment of activities in the nuclear field No. DD 24/2004 for the TREATMENT and INTERIM STORAGE of radioactive waste and spent

radioactive sources within Radioactive waste treatment plant within IFIN-HH, Bucharest, Magurele Town, Ilfov county, issued by CNCAN.
- Authorization for the deployment of nuclear activities in the nuclear field No. VP 02/2005 for radioactive materials TRANSPORT only to and from units or work points possessing authorization for the deployment of activities in the nuclear field, issued by CNCAN.
- Authorization for the deployment of nuclear activities in the nuclear field No. DD 25/2004 for the DISPOSAL of radioactive materials within the Radioactive Waste National Repository IFIN-HH Bucharest from Baita village, Bihor county, issued by CNCAN.
- Environmental authorization No. 1827/RV/11.12.2003 for the operation of the National Repository for low and intermediate level Radioactive Waste INCDFIN "Horia Hulubei" Bucharest, Baita village, Bihor county, issued by Bihor Environmental Protection Agency.

This environmental agreement is issued when the following conditions are met:

- Obtaining the decommissioning authorization from CNCAN.
- Obtaining the permits for the environmental protection from authorities competent for transporting and disposing radioactive waste.
- Compliance with all the specific radiological safety and physical protection norms in the nuclear field
- Notifying ARPM Bucharest about the completion of the decommissioning works.
- Submitting to ARPM Bucharest a report of the beneficiary on the quantities and types of waste generated as well as the results of the determinations on the level of ionizing radiations emissions, after completing the decommissioning, decontamination operations and mending of the site.
- Clearance of waste resulted from decommissioning from the license requirements of materials resulted from authorized practices in the nuclear field, will be proceeded only with CNCAN approval.
- Waste released from CNCAN license requirements, will follow the waste regime according to Law no. 426/2001, for the approval of GEO no. 78/2000 on waste regime, modified and completed by GEO no. 61/2006. Their transport will be made in accordance with the provisions of the Joint Order MAPAM/MTCT/MEC No. 2/211/118/2004 on the approval procedure and control of waste transport on the Romanian territory, with further modifications.
- Storage of waste released from CNCAN license requirements will be made in compliance with GD No. 349/2005 and MMGA Order No. 95/2005 on the acceptance criteria and on the preliminary acceptance criteria for the storage of wastes and the national list for the accepted wastes in each storage class.

According to art 16, par. 3, from GEO no.195/2005, on environmental protection, approved with amendments by Law no. 265/2006, **this environmental agreement is valid throughout the project implementation period.**
During the execution of works, the public authorities responsible for environmental protection control the compliance with the conditions imposed by the environmental agreement.

This agreement does not exempt the designer and the contractor from liability in case of accidents during the execution of the decommissioning works, transport and disposal.

Non-compliance with this agreement leads to its suspension or annulment, as the case may be.

EXECUTIVE DIRECTOR,
Chem. Simona Mihaela Saceanu

PREPARED by
Eng. Corneliu Sveanu
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Head of the licensing and conformity control department
Eng. Roxana Costache

In the attention of the environmental agreement holder:
The environmental agreement is the decision of the authority responsible for environmental protection which gives the project owner the right to accomplish the project. The environmental agreement is a written technical-juridical document, by which are established the conditions for the achievement of the project from environmental protection point of view.

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GLOSSARY OF TERMS

CNCAN	**National Commission for Nuclear Activities Control**
ANDRAD	**National Agency for Radioactive Waste**
AIEA	International Atomic Energy Agency
DNDR	**Radioactive Waste National Repository**
CNU	Spent Nuclear Fuel
DCNU	**Spent Nuclear Fuel** Storage Facility (capacity: 240 fuel assemblies)
STDR	**Radioactive Waste Treatment Plant**
DC	Cooling Pond (1 year minimum storage for irradiated fuel assemblies)
DFU	Used filters repository (pits closed with concrete lids)
HC	Hot cells (radioactive materials processing)
CS	Carbon steel
SST	Stainless steel
C	Concrete
HLW	High Level Waste (>2kW/m^3)
LL-ILW	Long-Lived Intermediate-**Level Waste (>400Bq/g, time ½>30 years)**
SL-ILW	Short Lived Intermediate - Level Waste (time ½ <30 years)
EW	Exempt waste (lead to <0,01mSv/pers.)
HEPA filter	Filter with η of retaining the dust >99,95%