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Directorate D – Nuclear Energy
D.4 – Radiation Protection

Main Findings of the Commission's Article 35 verifications in Romania

URANIUM MINING AND PROCESSING AND NATIONAL MONITORING NETWORKS

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MAIN FINDINGS

1 INTRODUCTION

Article 35 of the EURATOM Treaty requires that each Member State shall establish facilities necessary to carry out continuous monitoring of the levels of radioactivity in air, water and soil and to ensure compliance with the basic safety standards [(1)].

Article 35 also gives the European Commission (EC) the right of access to such facilities in order that it may verify their operation and efficiency.

For the EC, the Directorate-General for Energy (DG ENER) – formerly Directorate General for Energy and Transport (DG TREN) – and in particular its Radiation Protection Unit (ENER D.4) is responsible for undertaking these verifications.

The Commission's decision to request the conduct of an Article 35 verification was notified to the Romanian authorities on 13 June 2008. Subsequently, practical arrangements for the implementation of the verification were made with the persons designated by the Romanian authority.

For the purpose of such a review, a team of three inspectors from DG TREN H.4 visited Romania from 18 to 26 August 2008. The goal of this verification was to obtain complete information and to verify a number of monitoring installations involved in the environmental radioactivity monitoring of the Crucea uranium mining site, situated in northern Romania, the Feldioara uranium milling and processing plant, situated in central Romania and several environmental radioactivity monitoring and measuring sites located in the above-mentioned parts of Romania (Transylvania and Moldova regions). The laboratories performing the measurements were also included into this verification.

The visit included meetings with representatives of various national authorities having competence in the field of radiation protection. Progress in food import control was discussed with authorities in charge of this issue such as the Ministry of Health, the National Sanitary, Veterinary and Food Safety Authority, and the National Customs Agency. A closing meeting was held, with all parties involved during the visit, at the premises of the National Commission for Nuclear Activities (*CNCAN*).

The present report contains the results of the verification team's review of relevant aspects of the radiological environmental surveillance in and around the nuclear sites of Crucea and Feldioara, as well as of the regional radiological surveillance in the central and northern parts of Romania.

The report is based on the verification findings, on information collected during the verification including documents received and on discussions with various persons met during the visit.

The proposed verification programme could be completed within the time allocated. In this regard the verification team appreciates the advance information supplied, as well as the additional documentation received during and after the verification.

1 Directive 96/29/Euratom, Council Directive of 13 May 1996 laying down basic safety standards for the health protection of the general public and workers against the dangers of ionising radiation (OJ L 159, 29.6.1996, p. 1).

2 COMPETENT AUTHORITIES AND LEGAL BACKGROUND

2.1. INTRODUCTION

According to the legislative framework in Romania, *CNCAN* is the only authority having responsibility with regard to radioactive discharges.

The main ministries and organizations having different responsibilities in the field of environmental radioactivity monitoring (including the surveillance of food stuffs) are:

- *CNCAN*;
- Ministry of Environment and Sustainable Development (*MMDD*), through NEPA;
- Ministry of Health (MH), through the public health authorities and the network of ionizing radiation hygiene laboratories co-ordinated by the Institute of Public Health;
- Ministry of Agriculture, Forests and County Development;
- National Sanitary Veterinary and Food Safety Authority (*ANSVSA*);
- National Agency for Radioactive Waste (*ANDRAD*).

Additionally, there is another governmental body, the Nuclear Agency, a specialised body of the central public administration, under the subordination of the Ministry of Economy, Trade and Business Environment. The agency provides technical assistance to the Government, by elaborating strategies for national programs in the nuclear domain. It draws up and monitors the implementation of research, development and innovation policy in the nuclear field.

The agency can ask *CNCAN* to supply information regarding the safety of nuclear installations in order to issue their own report. The elaboration of the national nuclear safety strategy is a task of *CNCAN*.

2.2. NATIONAL COMMISSION FOR NUCLEAR ACTIVITIES CONTROL (*CNCAN*)

The National Commission for Nuclear Activities Control (*CNCAN*) is a national public institution, acting as a legal entity. It is the national competent authority in the nuclear field and functions under the direct coordination of the Prime Minister.

Since its creation in 1961, *CNCAN* faced various reorganisations.

The first regulatory organisation in the field of nuclear practices occurred in 1961, imposed by Ministerial Order 741/1961. The body was called Committee for Nuclear Energy of the Council of Ministers. In the same year, within the National Atomic Physics Institute, the Commission for Guidance and Control of the Nuclear Units was created, thought to be a control organism regulated by the Commission of Nuclear Energy.

The Commission changed the name to *CNCAN* in 1990 by Decree no. 29/1990. In that period *CNCAN* was under the subordination of the Ministry of Environment. In 1998 *CNCAN* became an independent body (Law 16/1998).

In 2001, *CNCAN* moved back under the responsibility of the Ministry of Environment. From 1998 until 2001, *CNCAN* coordinated the National Environmental Radioactivity Surveillance Network (NERSN). By the Governmental Decision no. 894/2003 and Law 193/2003, *CNCAN* entered under the direct jurisdiction of the Prime Minister and it became, again, an independent body.

According to the Law no. 111/1996, on the safe deployment, regulation, authorisation and control of nuclear activities (republished), *CNCAN* is the national competent authority in the nuclear field, with duties in regulation, licensing and control of nuclear practices.

2.3. MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

The legislative framework empowers the Ministry of Environment and Sustainable Development (*MMDD*) to license practices and activities resulting in a release of radioactivity into the environment. The environmental permit issued by *MMDD* is based on environmental impact assessment studies and several prerequisite licenses issued by other authorities, such as: *CNCAN*, the Ministry of Health, and the Ministry of Labor, Family and Equal Opportunities.

According to the Environmental Protection Decree no. 195/2005 (Art. 47), and approved by Law 265/2006, the Ministry of Environment, as central authority for environmental protection, is responsible for the monitoring and surveillance of environmental radioactivity all over the national territory, with the general purpose of ensuring compliance with regulations, and protecting the population and the environment against harmful exposure to radiation.

In order to fulfil its legal obligations regarding monitoring of environmental radioactivity and off-site emergency planning and response, *MMDD* organises and operates under its authority the National Environmental Radioactivity Surveillance Network (NERSN), which is a part of the National Environmental Integrated Monitoring System.

2.3.1 National Environmental Protection Agency

Within the Ministry of Environment and Sustainable Development, the National Environmental Protection Agency (NEPA), was created as thecentral environment protection authority in order to ensure the technical support and to coordinate the National Integrated Monitoring System, including the National Environmental Radioactivity Surveillance Network (NERSN). In this respect, NEPA operates a reference laboratory for radioactivity (NRL). This laboratory ensures the scientific and methodological coordination of NERSN.

NEPA shall notify *CNCAN* and the Ministry of Interior and Administrative Reform on its findings in the monitoring activity exercised by it, and shall collaborate with these in order to set up any necessary measures to be taken.

2.4. MINISTRY OF HEALTH

In accordance with Law 95/2006, the Ministry of Health (MPH) is the central authority for public health, coordinating public health assistance.

In Romania, responsibility is established according to the provisions of the Nuclear Law 111/1996, on the safe deployment, regulation, authorization and control of nuclear activities. According to Art. 39 of this Law, the Ministry of Health is responsible for organising the surveillance network of the radioactive contamination of food products, over the whole food chain, including drinking water, as well as other goods designated to be used by the population.

The Ministry of Health shall inform *CNCAN* and other interested ministries of its findings within its monitoring activities, and collaborate with these in order to establish the joint actions called for.

2.5. NATIONAL SANITARY VETERINARY AND FOOD SAFETY AUTHORITY

According to the Governmental Decision no. 130 of 29.01.2006 on the organisation and functioning of the National Sanitary Veterinary and Food Safety Authority (*ANSVSA*), as published in the Romanian Official Gazette OG no. 90, 31.01.2006, this is a specialised institution of the central public administration, and the regulatory authority in the area of sanitary, veterinary and food safety. *ANSVSA* is under the Government subordination and under the coordination of the Ministry of Agriculture, Forestry and County Development

2.6. NATIONAL AGENCY FOR RADIOACTIVE WASTE

The National Agency for Radioactive Waste (*Agenţia Naţională pentru Deşeuri Radioactive – ANDRAD*) was established in 2004 by Governmental Ordinance No. 11/203, republished in 2007. *ANDRAD* is a public institution under the subordination of the Ministry of Economy, Trade and Business Environment. By law, this body is the national authority in charge of coordination of the activities for the safe management of radioactive wastes, including those resulting from decommissioning of nuclear and radiological installations (also uranium mining and milling). It develops a strategy on this item, which is part of the national strategy for the energy sector in Romania that has to be approved by the Ministry of Economy, Trade and Business Environment.

The budget of *ANDRAD* is established at ministerial level. *ANDRAD*'s activities are financed by the waste producers.

2.7. NATIONAL URANIUM COMPANY

The National Uranium Company S.A. was set up by the Government's Decision no. 785 of 2 December 1997, modified by Government Decision no 729/2004. It is directly financed by the Ministry of Economy, Trade and Business Environment. The Company administers the uranium mineral resources of Romania and deals with geological research and exploitation activities of uranium ores, ore processing and refining of concentrates, including transportation and marketing of these materials.

The National Uranium Company focuses its activities on two branches: one regarding the mining activities mainly in three regions of Romania: the Banat - (western Romania), the Bihor - (north-western) and the Suceava - (north) regions; the second branch concerns uranium milling and processing activities in the Feldioara plant (central Romania).

The company also aims at restoring the areas affected by uranium exploitation and milling, and at promoting efficient means for environmental protection in the zones under exploitation. Quality conditions are in accordance with international standards concerning the final product. The company ensures the necessary supply of UO_2 powder in a form that can be sintered, to produce the nuclear fuel for the Romanian Nuclear Power Plant Cernavodă.

3 MONITORING OF RADIOACTIVE DISCHARGES AND ENVIRONMENTAL RADIOACTIVITY AT THE URANIUM MINING SITE AT CRUCEA

3.1. URANIUM MINING IN ROMANIA – HISTORY

Around 1950, (like in other East-European countries), uranium exploration was subject of a joint venture between the Soviet Union and the National Uranium Company. Large geological

surveys were performed in the south-western (Banat county) and north-western (Bihor county) regions of Romania.

In 1952, uranium mining commenced as an open-pit excavation, in the Bihor region (Băiţa Plai). Around 1960 the exploitation of uranium continued by opening underground excavation mines at two other important sites in the Bihor region (Avram Iancu mine) and in the Banat region (Dobrei, Natra and Ciudanoviţa mines).

All uranium ore of this exploitation had to be delivered to the Soviet Union. The total amount estimated to have been transmitted until 1963 to the then USSR, was about 20 000 tons.

The Romanian-Soviet Union joint venture ended in 1963, all transport of uranium outside the country's borders was stopped. From then onward, "*Organizaţia Expediţia Geologică*" was responsible for uranium exploitation in Romania.

After 1963, Romanian authorities expanded the geological exploration and discovered new uranium deposits in northern Romania, in the Moldova region (Crucea, Botuşana and Tulgheş-Primatar mines).

In 1976, the Feldioara plant was built for the extraction of uranium from the ore (using the depression alkaline leaching technique).

Uranium transfer from the Bihor and Banat mines to the processing plant at Feldioara started in 1977. First samples of uranium yellowcake ammonium diuranate were produced.

Between 1983 and 1985 the Crucea – Botuşana mines were commissioned as well as the uranium ore delivery to Feldioara.

In 1996 the first genuine Romanian batch of uranium dioxide powder was used in the CANDU-6 type Unit 1 reactor at the Cernavodă NPP.

Currently, the uranium needed for the normal life cycle of the two CANDU reactors presently in operation at the Cernavodă NPP is ensured by the U_3O_8 and ammonium diuranate (DUA) stocks produced and stored at the Feldioara processing plant.

Recently, a new uranium deposit containing a few thousand tonnes of uranium ore was identified in the Tulgheş – Primatar area (Harghita and Neamţ counties), in the central part of the Eastern Carpathians. A possible mining exploitation is still under negociation.

3.2. URANIUM MINING ACTIVITIES AT THE CRUCEA SITE

The verification team received extensive information about the uranium mining activities at the Crucea/Botuşana site.

The Crucea/Botuşana site represents two underground mines separated by 4 km. From Botuşana, the uranium ore is hauled to Crucea, where all further uranium transport is combined. To allow mine water to be piped from the Botuşana mine to the Crucea mine, a tunnel has been driven. Tunnels that are not used anymore are backfilled with waste rock. An overview of the mine's location is shown in Appendix 3 of the Technical Report.

The whole mining site employs about 760 people. The radiation protection staff is composed of four persons plus an administrator.

The Crucea mine administration sends annual reports to *CNCAN*, to the Ministry of Environment (including LEPA-Suceava), to local public bodies, and to the Radiation Hygiene laboratory of the Ministry of Health. Every semester intermediate reports are sent to public administrations. For every new working procedure Crucea has to inform *CNCAN*. Operating authorisations are yearly revised and frequently updated. The above mentioned bodies are entitled to inspections of the site.

3.3. MONITORING OF RADIOACTIVE DISCHARGES FROM THE CRUCEA MINING SITE

3.3.1 General

The verification team visited the Crucea mining site up to the level of the main entrance tunnel and shaft of the underground mine ("*PUŢ*" Crucea). The above ground mine area is not fenced-in but the access road is well guarded. A barrier exists at the entrance to the mining site.

The storage of explosives used for mining purposes is situated in a tunnel in the vicinity of the mining site entrance under safe conditions.

Since 2007 mine waters from the Botuşana site are piped to the Crucea mine in the connecting tunnel. Before, mine water run-off from the Botuşana mine went directly to the small stream called *Pârăul lui Ion* that feeds into the river Bistriţa. From the Crucea mine all mine waters are collected in a 23 m deep and 4 m wide concrete storage shaft that leads to a mine water reception basin. If necessary mine waters could be led to a cavity in deeper parts of the mine for intermediate storage.

The verification team was shown the mine water outlet from the Crucea mine main entrance tunnel, from where it is led into the storage shaft.

The verification team witnessed the Crucea mine water reception basins. From there mine waters are piped to the water decontamination building (see chapter 6.3.2). Sedimentation in the water reception basins is by gravitation. Water is piped out when necessary, two to three times per day. The sediment is collected periodically and disposed of in the mine.

3.3.2 Liquid discharge monitoring

The verification team visited the liquid discharge decontamination station and received an explanation about its operation.

The station building houses both, the old (now unused) and the new decontamination stations, as well as the mine operator's environmental control laboratory. Decontamination is done using a specific ion exchange resin with very high efficiency to remove uranium. The efficiency of removing radium is lower.

The new decontamination unit comprises two parallel lines of three resin columns, of which at any time two are in function, the other one being regenerated. A pipe system with regulation valves connects all columns to allow flexible operating conditions. A flow meter is situated at the exit of the discharge chain. Each column is charged with 3.2 m^3 of resin; each line cleans about 1500 m^3 of mining water per day. The team was told that operation of one column would suffice to handle the current cleaning volume.

Verification does not give rise to specific remarks.

3.3.3 Gaseous discharge monitoring

Two distinct aerial discharge controls are performed, one at the Crucea mine, and the other one at the Botuşana mine. Non-continuous monitoring for Rn is done daily using a *Pylon* radon monitor.

The verification team acknowledged the logbook where the calculations for the aerial discharge of radionuclides are noted (including radon daughter measurements, which are done bi-annually).

Verification does not give rise to specific remarks.

3.4. CRUCEA MINING SITE: OPERATOR'S ENVIRONMENTAL RADIOACTIVITY MONITORING PROGRAMME

3.4.1 Surface water, sediments

The verification team was told that surface water sampling is performed at several places on site (daily) and in the vicinity of the site, including the river Bistriţa. Up to two litres of water are sampled. Sample analysis is done in the mine's laboratory.

The team acknowledged the sampling points for river water up and down stream of the discharge point. The sampling points were very well marked. Sampling of surface water off-site is done on a monthly/quarterly basis.

3.4.2 Vegetation and soil samples

The verification team was informed that several points have been defined for vegetation and soil sampling:

- The truck road between Crucea and Argestru (at 4 locations, annual collection);
- Argestru railway station ore loading facility (10 sampling points for soil and vegetation);
- The truck road Grinţeş – Crucea (at 8 locations, annual collection).

The team was shown the sampling point for soil and vegetation located near the mine's administrative building in Crucea village, on the river bank.

3.4.3 Dose rate and dose

Gamma dose probes (TLDs) are mounted on the lower parts of some high voltage pylons situated along the truck road between Crucea and Argestru (at the villages Crucea, Chiril, and Rusca and the entrance of Vatra Dornei).

Reading is done quarterly by the Suceava branch and annually by Feldioara staff.

Additionnally, there are ten other points at the Argestru railway station ore loading siding. There, the reading is done twice a year.

With regard to (on-site and off-site) environmental monitoring by the operator the verification does not give rise to specific remarks.

3.5. OPERATOR'S ENVIRONMENTAL CONTROL LABORATORY

The verification team visited the Crucea mine's environmental control laboratory which only performs measurements of uranium in water. All other analyses are done in Feldioara.

Laboratory staff comprises one chemist, two technicians, and four additional workers. One supervisor is available.

The laboratory has two different sample registration books; one for liquid effluents and a second one for surface water samples.

Sampling procedures including sketches of the sampling locations are in place on site.

The verification team noted that the laboratory has no UPS. Due to the short measuring times securing electric power seems un necessary.

The verification does not give rise to specific remarks.

3.6. ORE LOADING FACILITY AT VATRA DORNEI, ARGESTRU

The verification team visited the ore loading site at Argestru, near Vatra Dornei. It received a full explanation of the relevant procedures.

At the station, before unloading, the trucks transporting uranium ore are measured and weighed. For the purpose of measuring ten detectors are placed under the roof of the measuring station, five on each side; contamination protection is done by covering the most exposed detectors with plastic bottles cut accordingly. An old *MM-IMR* high voltage device and rate meter are used for radiation measurement; a modern *Sartorius* heavy weight scale is used for weighing the trucks.

The team was informed that every morning background measurements are done by the personnel.

The team was told that every three months a special 'calibration' wagon (filled with a known amount of uranium ore) is used to calibrate the measurement system at the railway station. This wagon usually is stationed at Feldioara.

The verification does not give rise to specific remarks.

4 MONITORING OF RADIOACTIVE DISCHARGES AND ENVIRONMENTAL RADIOACTIVITY AT THE FELDIOARA URANIUM MILLING AND PROCESSING SITE.

4.1. INTRODUCTION

The Feldioara uranium milling and processing plant is situated in the center of Romania, in Braşov County. It is located at 8 km west of the town Feldioara and at approximately 2 km northeast of the village Crizbav. It covers an area of 583 hectares. The plant was commissioned in 1978.

Several criteria were applied for placing the site in this area: the relatively isolated neighbourhood; the presence of forests (which was seen as an advantage regarding security); the harmonious morphology and geohydrology.

The main activities at the Feldioara site concern the milling and processing of the natural uranium ore extracted from Romanian mines and the refining of the uranium concentrate with a view to producing uranium dioxide, which is the main component to produce CANDU 6 fuel elements for the Cernavodă NPP. The nuclear fuel elements are produced at the Piteşti nuclear fuel plant FCN (Fabrica de Combustibil Nuclear), which is the authorised Romanian CANDU fuel element manufacturer. Since 1997 all nuclear fuel for the Cernavodă NPP is produced in Romania.

The Feldioara site processes uranium ore from two mines, Botuşana and Crucea. The ore arrives by train at the uranium receipt station where a qualitative and a quantitative check is performed, including measurement of the uranium content of the ore.

From a radiation protection point of view the Feldioara site is split into two zones (together forming the "sanitary protection zone"):

- The **controlled zone**, delimitated by a concrete fence. The radiological surveillance of the environment is done via dose rate probes situated at different points on the perimeter and by measurement of the degree of contamination of surfaces, tools, equipment and people. Accumulated solid and liquid radioactive discharges are monitored as well.
- The **surveillance zone**, reaching out between the concrete inner fence and the barbed wire fence forming the outer border of the site. In this zone, a radiological environmental monitoring is performed especially for the settling ponds, wells, soil and vegetation. This zone contains several forests which include ponds. The area is guarded-off.

The uranium leaching process leads to liquid wastes, which are piped to tailings ponds situated in the zone of surveillance, for sedimentation. From the final tailings pond the liquids are piped to a purification station. After removing most of the uranium and some of the Ra-226 using ion exchange resins the liquids are discharged into the river Olt.

In total, 500 persons work on the Feldioara site (including all auxiliary tasks). The verification team was told that production is organised in campaigns.

The environmental control laboratory shares its equipment with another structure at the site that analyses also samples from other uranium sites in Romania.

4.2. MONITORING OF RADIOACTIVE DISCHARGES

4.2.1 General

The verification team inspected the Feldioara site, in particular the production area, the laboratory, the settling pond, and the discharge purification installation. At the time of the visit most of the staff of the site was on vacation, thus no production and no work in the laboratories took place. The team was told that the radiation protection section at the site employs 15 staff. The National Uranium Company's chief inspector for radiation protection at Feldioara was available to the team for information and explanations.

At the time of the visit some dismantling and repair work was ongoing at the site. The site gave the impression to urgently need renovation, at least with respect to building structures.

4.2.2 Liquid discharge monitoring

The verification team received a full explanation of the discharge monitoring facilities at the site.

The plant operates very much (20 – 30%) below the originally foreseen capacity, thus currently the liquid waste release volume is low.

All waters, including rain water and waters coming from various uses such as toilets, after conventional purification go to one liquid discharge system. The liquids are piped to a pond (Cetăţuia 2 lake) that contains all contaminated waters. The lake is divided into two compartments, the first compartment being completely full with sediments and the second compartment currentlx in operation. Cetăţuia 1 lake is an artificial pond at a somewhat higher altitude with non-contaminated water that serves feeding the plant with clean water for "industrial" purposes.

After a first sedimentation in Cetăţuia 2 the remaining liquid is piped to another pond (Mitelzop pond) for further settling. The waters from this pond are "decontaminated" in the decontamination building by ion exchange treatment to remove most of the uranium. Radium is also removed to a certain extent. From there the waters are piped to the Olt River that flows at several kilometres east-northeast of the Feldioara plant. The discharge limits are defined by the Ministry of Environment and were renewed in 2006 for a period of six years.

Tailings ponds

The verification team was shown the large tailings ponds. At the time of the visit security staff were patrolling the area. Access to the location is possible only using a 4-wheel drive car. The pond area is owned by the National Uranium Company S.A.. Part of the land in the surveillance zone belongs to the Feldioara municipality.

Decontamination building

The team verified the decontamination building of the plant. It is locked for physical protection. Generally, operating times are three months per year; apparently the natural evaporation of water in the discharge pond does not necessitate a higher frequency. In the building four lines with four ion exchange columns each are installed, each column is 2.5 m diameter and 10 m in height. The columns can be operated in parallel or in series; usually eight colums are working in series. Decisions on ending a purification process are based on checks of the purification capacity. According to a specific order, valves are set such that after termination of a purification task the last column in the purification process is bypassed and set for regeneration. The column that has been recently regenerated is set as first column, receiving fresh input from the pond.

Regeneration of the resin is done with NaCl solution. The process takes some 8 hours. The regeneration residues are kept in basins. Four basins of a 80 m^3 each are available for this purpose. At a certain salt concentration the material is transported by truck back to the factory to remove the uranium.

The verification team noticed some signs of deterioration of the building. The team was informed that a new treatment station for decontamination is already in project status and will start construction after 2012.

Olt River discharge point

The verification team performed a visit in Rotbav village where the liquid discharge point into the river Olt was seen.

The verification team urgently recommends finding a stable solution for long term restoration and remediation of any unused tailings ponds. It encourages any improvement work on structural deficiencies.

4.2.3 Gaseous discharge monitoring

The Feldioara plant is in operation 10 months per year (except July and August) and monitoring of gaseous discharges is done only when the installation is running.

Before any releases to the environment the air at the production sites is filtered. These filters are scrubbed with water (that goes into the liquid discharge system).

The team was told that for technical reasons aerial discharges are only relevant in case of extraordinary events. Even in such a case, all radioactivity would be deposited in the near surroundings, the area furthest away being the forest surrounding the site.

Online monitoring of aerial discharges does not exist. The team was informed that this is due to technical problems that would be expected in setting up such a system, and the demand for having expensive devices for radioactive emissions with very low probability and radiological relevance.

4.3. OPERATOR'S ENVIRONMENTAL RADIOACTIVITY MONITORING PROGRAMME

4.3.1 On-site monitoring

4.3.1.1 Air

The verification team was informed that the monitoring of radon concentrations and dry deposition on site is done according to the procedures in place and according to the local monitoring programme for working areas in force at the Feldioara plant. With regard to environmental effects all impact estimates are based on the gaseous emission monitoring.

4.3.1.2 Dose rate and dose

Gamma dose probes (TLDs) are placed on several high voltage pylons placed along the roads crossing the Feldioara site. The probes are situated at one meter height from the ground and measurements are performed once per year.

4.3.1.3 Waters

Altogether there are 19 wells located in the sanitary protection zone and its proximity.

4.3.1.4 Vegetation and soil samples

The verification team was informed that there are two soil and vegetation sampling points on-site. They are sampled twice a year.

4.3.2 Off-site monitoring

4.3.2.1 Dose and dose rate

Gamma dose probes (TLDs) are placed on several high voltage pylons placed along local streets and national roads in the surroundings. The probes are situated at one meter height from the ground and measurements are performed once per year.

4.3.2.2 Drinking water

The verification team was told that currently in Rotbav Village there are four wells selected by the Feldioara plant to sample drinking water monthly. At the time of construction of the Feldioara site all drinking water supplies were from individual wells; however, now a municipal water supply system pumps water from the mountains in the east.

4.3.2.3 River water and sediment

There are four surface water and sediment sampling points established. Two are along Olt River, the main river in the area, one upstream (at Feldioara) and one downstream (at Măieruş) of the discharge pipe from the decontamination plant. One sampling point is at the river Rotbăşel, one at the river Crisbăşel, two small brooks in the area. Sampling is performed quarterly; samples are analysed by the Feldioara laboratory.

4.3.2.4 Soil and Vegetation

There are some 10 sampling locations for vegetation and soil outside the plant, situated between the main buildings of the Feldioara plant and the river Olt. Sampling is done twice a year.

> *With regard to the on-site and off-site environmental monitoring programme as performed by the operator the verification does not give rise to remarks.*

4.3.3 Operator's environmental control laboratory

The verification team was informed that at the Feldioara plant two groups have been set up dealing with samples from the site and also from other uranium production related areas: the section "research, radiation protection and environmental conditions" (*Cercetare, Radioprotecţie, Factori de Mediu, CRFM*) and the plant's local control laboratory. These groups use the same devices and apply the same procedures but have different staff. At the time of the visit due to vacation the laboratories were not operating.

The local control laboratory is responsible for the monitoring of the Feldioara plant.

Fifteen persons are working in the research section, of these two scientists, four engineers and a medical doctor. The Feldioara local radiation protection laboratory employs four persons.

Quality assurance

The laboratory and the research section do not have RENAR accreditation. Feldioara has periodical internal audit sessions for QC.

Archiving and reporting

The laboratory has an archive for soil, vegetation and sediment samples (ashed) at the Feldioara research sector.

All data are kept on paper. The local mining zones reports are sent monthly to the National Uranium Company. Consolidated reports are sent monthly to the National Uranium Company, to LEPA Brasov, to the regional public water authority, and to Feldioara City Hall.

An annual report containing local and sector results is sent to *CNCAN* via the company headquarters.

Equipment

The verification team acknowledged the intention to modernise the Feldioara laboratory.

> *The verification team encourages all efforts to modernise the laboratory. With a view to facilitating quality controls it suggests marking all measuring devices with the latest calibration date.*

5 INDEPENDENT CONTROL BY THE REGULATOR IN THE URANIUM MINING AND MILLING INDUSTRY

5.1. INTRODUCTION

Romanian authorities exercise an environmental radiological control and monitoring of all uranium mining and milling installations and of their surrounding territories.

Within the authorisation process *CNCAN* approves discharge limits, derived from annual dose limits; it assesses and approves the plans for discharges of radioactive substances. In cooperation with the local Environment Protection Agencies *CNCAN* also establishes the monitoring locations and maximum allowed concentrations for radioactive pollutants such as uranium and radium in environmental media.

Environmental authorisations are issued by the central authority for environmental protection on the basis of the criteria provided by the laws in force. In consultation with *CNCAN* and the Ministry of Health they are completed with specific authorisation and control criteria.

In practice, the regulator runs his own monitoring programme including the controlled area of the mines and their surroundings, using mostly the same sampling points as those used by the operator (including for food and vegetation).

5.2. OCCUPATIONAL HEALTH ASPECTS

CNCAN, from a radiological point of view continuously follows the personal health monitoring of all workers in the uranium mining, uranium processing and fuel fabrication industries regarding the application of legal requirements. Similar attention is given to environmental protection.

CNCAN also assesses the radiological risks of uranium mining. In some cases, these risks constitute the technical basis to close uranium mines which are presently still in a conservation state.

5.3. NEPA'S PROGRAMME

With regard to uranium production related activities the SSRMs (the radiological laboratories of the LEPAs) – besides their routine programmes with regard to national environmental radioactivity monitoring – have specific monitoring programmes in place. These programmes are elaborated by the regional LEPA laboratory in close collaboration with NEPA. They are streamlined to the local conditions.

With regard to the Crucea uranium mining site the relevant SSRM is that of Suceava (verification see chapter 9.3.2.4). The sampling and analysis programme as defined by NEPA is shown in Appendix 4.

With regard to the uranium milling and processing site at Feldioara the responsible body is the SSRM of LEPA Braşov (verification see chapter 9.3.2.1). Its programme takes into account that the network of water bodies in the Braşov region is very dense and many rivers cross the land in the vicinity of the Feldioara site.

5.4. CONTROL ACTIVITIES BY PUBLIC HEALTH AUTHORITIES

With regard to some areas (e.g. foodstuff monitoring, occupational health aspects) the local public health authorities play an important role.

For example, at the Feldioara uranium milling and processing site, the Public Health Authority of Braşov samples and measures the deposition on one of the buildings' roofs and near the ponds. The plant operator is informed about the results of these measurements.

6 NATIONAL MONITORING OF ENVIRONMENTAL RADIOACTIVITY, DESCRIPTION AND VERIFICATION

6.1. GENERAL

Continuous monitoring of environmental radioactivity on the Romanian territory is carried out by several organisations. A major part of the national monitoring is performed by the National Environmental Protection Agency (NEPA) and the Local Environmental Protection Agencies (LEPA). NEPA has a reference laboratory for radioactivity (NRL), which ensures the surveillance through a national environmental radioactivity surveillance network (NERSN), consisting of ten '24 hour', one '16 hour' and twenty-six '11 hour' radiological laboratories[2] (Surveillance Station of Radioactivity Monitoring - SSRM) of the LEPAs and through the automatic early warning system for radiation in the environment (EWS). EWS supports routine radiological surveillance and provides monitoring data needed in emergency situations. Data from EWS are provided also to the EURDEP system managed by JRC-Ispra.

[2] '24 hour' programme means four measurement series per day; '16 hours' means three per day; and '11 hours' signifies two per day.

The NERSN standard monitoring programme of these 37 laboratories includes measurements of air, water, vegetation, uncultivated and cultivated soil.

Currently NEPA is in a process of modernisation and upgrading the capabilities of the NERSN network and the NRL laboratory.

The NEPA laboratory in Bucharest (NRL) organises training for the LEPA-SSRMs; for this task it has technical assistance from Liverpool University, through an EU Phare project.

6.2. AUTOMATIC SYSTEMS

Romania operates automatic systems for the monitoring of ambient gamma dose rate all over the country and particularly at locations close to NPPs (Cernavodă in Romania and Kozloduy in Bulgaria).

6.2.1 Ambient gamma dose rate monitoring networks

Altogether, the automatic ambient dose rate monitoring system comprises 88 stations, spread over the national territory and close to NPPs, all with real time data transmission.

Data from 49 of those ambient gamma dose rate measurement stations (early warning system) are sent daily to the EC through the EURDEP platform; an additional 39 ambient gamma dose rate measurement stations ('new' system) are still in the installation phase.

6.2.1.1 For the national territory – 'old' system

All of NERSN's laboratories still operate dose rate monitoring devices of the 'old' system, based on detectors produced by *IFIN-HH* (type *TIEX*, using GM tubes; connected to a base station). Each base station displays instant data (four second intervals) and hourly averaged data. Data transmission to NRL Bucharest is daily, by manually sending the values (thus the system is not completely automated). The system is planned to stop operation when the new system proves to be working reliably.

6.2.1.2 For the national territory – 'new' system

The 'new' system is composed of 39 ambient dose rate monitoring stations. The dose rate probes are from *Umwelt- und Ingenieurtechnik GmbH* (*UIT GmbH*), Dresden, Germany, model *HNQ24*.

The verification team was informed that – due to problems with the supplier – the 'new' system is not yet in routine operation.

Each detector consists of two GM tubes and has a measuring range of 0.03 µSv/h – 10 Sv/h. For dose rates of 10 Sv/h up to 100 Sv/h the monitor will show a minimum of 10 Sv/h.

Automatic stations at LEPA Braşov

The verification team acknowledged both, the 'old' *TIEX* device from *IFIN-HH*, Bucharest, Romania, and the 'new' system from *Umwelt- und Ingenieurtechnik GmbH* (*UIT GmbH*), Dresden, Germany.

The 'old' dose rate monitoring system is installed in the premises of the SSRM, with the probe mounted on a guard rail on the roof platform and the ratemeter device located in a room of the laboratory. Maxima and averages of the hourly measurement results are manually introduced in *EXCEL* files that are sent by e-mail to NEPA as daily reports. Monthly, an interim report is also provided by the laboratory to NEPA. The team was informed that this system is still used because of problems with the 'new' system.

The 'new' measuring device is located in a school yard (belonging to the *Liceul Unirea*), in a distance of some 200 m from the laboratory. The location was selected by LEPA Braşov. Initially it was forseen to choose another location but the city's public authorities – for historical reasons (Braşov is a very important national heritage city) – did not allow digging a suitable hole for the base-plate needed at that place.

The team witnessed that the schoolyard is protected by a 2 m high wall. The corner of the part where the devices are situated is separately fenced-in, to avoid vandalism. An extra grated fence protects the devices. Several trees stand close-by, towards the street, somehow overshading the device. The team had the impression that the solar panel and the electronics cabin shield the detector tubes that are mounted 1 m above ground, which does influence measurement; however, LEPA considers that there are no shielding effects based on the Contractor's statement

> *The verification team suggests improving the installation of the 'new' gamma dose rate probes to avoid any shielding effects. It recommends finding efficient solutions for all current technical problems (such as the data link between the measurement location and the laboratory).*

Automatic stations at LEPA Sibiu

The verification team saw both, the 'old' dose rate monitoring system from *IFIN-HH*, Bucharest, Romania, and the 'new' system from *Umwelt- und Ingenieurtechnik GmbH* (*UIT GmbH*), Dresden, Germany, that had recently been received and installed.

For the installation of the 'new' gamma dose rate monitoring system, the laboratory had to place the devices, including the fence which has a lockable gate and the meteorological mast, outside the fenced-in orchard surrounding the LEPA building, close to the pedestrian footpath of the street. The team was told that the land does not belong to LEPA but to air traffic control that did not allow cutting any of the fruit trees in the orchard necessary for placing the device. All other sampling devices operated by LEPA are placed in the orchard. The team noted that the system has the 'standard' set-up, thus the GM tubes are shielded by the solar panel and the electronics cabinet. Although outside the orchard itself, one tree is located close to the measuring equipment, thus probably leading to a significant shielding effect. Data transmission to the weather data logger is provided by a radio link, and for dose rate by a cable.

> *The verification team suggests improving the installation of the 'new' gamma dose rate probes to avoid any shielding effects. It recommends finding efficient*

solutions for all current technical problems (such as gaps in the data from the two detector tubes).

Automatic stations at LEPA Târgu-Mureş

The verification team saw both, the 'old' dose rate monitoring system from *IFIN-HH*, Bucharest, Romania, and the 'new' system from *Umwelt- und Ingenieurtechnik GmbH* (*UIT GmbH*), Dresden, Germany.

The 'new' gamma dose rate system is situated at some 7 m from the bridge over the river Mureş that is towering some 5 m above the measuring station, and at 15 m from the 10 m high LEPA building. Originally, the system was located better, in a small garden behind the building, more removed from any obstacles, near the soil sampling site. Due to problems with the meteo data radio link to the laboratory (gamma dose rate data are transmitted by cable), a compromise for the location of the system had to be found. The place is additionally fenced-in to protect it against vandalism.

The verification team suggests improving the installation of the 'new' gamma dose rate probes to avoid any shielding effects, e.g. by the solar panel.

Automatic stations at LEPA Suceava

The verification team saw both, the 'old' dose rate monitoring system from *IFIN-HH*, Bucharest, Romania, and the 'new' system from *Umwelt- und Ingenieurtechnik GmbH* (*UIT GmbH*), Dresden, Germany.

Both systems are set-up and operated in the 'standard' way as described above, e.g. for LEPA Sibiu.

The 'new' gamma dose rate system (*UIT* Dresden), is situated relatively close (5 m approximately) to the three storey building where the laboratory is situated.

The verification team suggests improving the installation of the 'new' gamma dose rate probes to avoid any shielding effects, e.g. by the solar panel or by the building.

6.2.2 Water monitoring

The automatic water radioactivity monitoring network of Romania comprises five submersible "intelligent" probes installed along the Danube River.

No station of the automatic water radioactivity monitoring network was included in the verification visit.

6.3. LABORATORY BASED NETWORK

6.3.1 Sampling and measurement programme

6.3.1.1 Air

In 2006, through a EU Phare project Romania received 18 new aerosol samplers (max. capacity 30 m^3/h) which have been installed in SSRM stations. If technically possible, the old devices are used as backup samplers.

The 'new' devices (type *VOPV-10*, made by *VF s.r.o.*, Slovakia) use a centrifugal pump with a processor controlled high-speed induction motor, a flow meter, a control unit, and a keyboard. A 2x16 character alphanumeric display that can show the current airflow, the total sampled volume from the start of the system, the sampled volume in a selectable time interval, the total number of operating hours from the start, temperature and pressure of the sampled medium, the status and error messages, and the current sampling time . After a power supply failure the device automatically restarts when power supply is restored.

6.3.1.2 Precipitation (wet and dry deposition)

Precipitation (dry and wet deposition) collectors are situated in the SSRM (LEPA) yards. The samples are taken daily. When it does not rain, the collector is washed with 1 litre of distilled water according to written procedures.

6.3.1.3 Ground water

A one litre sample is collected every day. After evaporation, the residue is measured for total beta the same day, for 1000 s.

6.3.1.4 Surface water

NERSN performs surface water monitoring for the whole territory, including of course the Danube River. Water is collected daily at different locations all over Romania

6.3.1.5 Drinking water

National monitoring for drinking water is carried out by the Ministry of Health (MH) network of ionizing radiation hygiene laboratories, according to provisions of art 38, 39 of Law no. 111/1996 based on the methodology elaborated by the Institute of Public Health (IPH) Bucharest.

6.3.1.6 Soil

In the Standard monitoring programme, at the NERSN stations uncultivated soil is sampled weekly

6.3.1.7 Vegetation

In the Standard monitoring programme, sampling of vegetation is done in the network's SSRM yards. Between 1st of April and 31st of October, once every week.

6.3.1.8 Foodstuffs

National monitoring of foodstuffs is carried out by the Ministry of Health (MH) through the network of ionizing radiation hygiene laboratories, in accordance the requirements of with Law no. 111/1996.

6.3.1.9 Milk

For the national monitoring programme MH's laboratories measure 10 litres of milk quarterly from the local dairies of each district in the country. .

6.3.1.10 Mixed diet

For the national monitoring programme MH's laboratories sample daily 2 – 3 meals served in schools, kindergartens and some other canteens. On quarterly bulked samples gross beta and

K-40 are determined. Yearly the content of Cs-137, Sr-90, Ra-226, and in some cases Po-210 is measured.

6.3.1.11 Individual foodstuffs

For the national monitoring programme, the following products are sampled quarterly: 7 kg meat, 5 kg fish, 3 – 5 kg cereals or flour or bread, 10 kg carrots, 5 kg cabbage, 6 kg potatoes, 5 kg tomatoes, 5kg peppers, and 10 kg apples.

The radionuclides assessed annually are: K-40, Cs-137, Sr-90, Ra-226 and in specific cases Po-210.

6.3.2 NEPA co-ordinated laboratories

After the Chernobyl accident in 1986 the monitoring network (NERSN) consisted of 47 laboratories all over the country. In 2000 it was reduced to 37.

NEPA's reference laboratory, NRL, gathers the results of all the gross beta measurements from the local LEPA-SSRM laboratories that are co-ordinated by NRL.

NRL transmits daily reports to the MMDD and other governmental organisations.

6.3.2.1 SSRM at LEPA Braşov

The verification team visited the local LEPA laboratory in Braşov, about 200 km north of Bucharest. Altogether, LEPA Braşov employs 50 persons, two of those form the basic staff for performing the the radioactivity measurements in the SSRM laboratory. Three other staff members are trained for radiological work when needed.

Within the NERSN system, SSRM at Braşov is an '11 hour station' handling environmental radiation monitoring samples according to the national monitoring programme for the region. In addition, it has a Feldioara uranium processing plant related special work programme which is defined together by NEPA and LEPA, based on the results of the measurements in the preceeding year. The verification team was informed that with regard to tasks related to Feldioara the sampling points (for water, soil and vegetation) of SSRM Braşov are completely independent from the ones of the Feldioara plant operator.

With regard to laboratory tasks and equipment the verification does not give rise to any specific remarks.

6.3.2.2 SSRM at LEPA Sibiu

The verification team visited the SSRM unit at LEPA Sibiu.

LEPA Sibiu is accommodated in a large modern building. Altogether, LEPA Sibiu employs 50 staff, 14 of whom workiin the monitoring department. From those 14, two (one chemist and a technician) are working in the radiological unit, the SSRM. One other staff member of the department acts as back-up for the laboratory technician if needed.

The monitoring department also operates the electronic database of the agency.

SSRM Sibiu is an '11 hour station' which handles environmental radiation monitoring samples according to the national monitoring programme in the region.

With regard to laboratory tasks and equipment the verification does not give rise to any specific remarks.

6.3.2.3 SSRM at LEPA Târgu-Mureș

The verification team visited the regional LEPA's SSRM laboratory, in Târgu-Mureş, some 200 km north of Sibiu. LEPA Târgu-Mureş employs 52 persons, six of them in the monitoring department. Two persons are employed in the radiological unit; one staff member of the department acts as back-up for the laboratory technician if needed.

Within NERSN, the SSRM Târgu-Mureş acts as an '11 hour station' handling environmental radiation monitoring samples according to the national monitoring programme in the region (including drinking water; vegetation and soil).

The verification team were shown a *Becker VT6* (1976) aerosol sampling device equipped with an *Actaris Gallus 2000* gas counter. The equipment has not yet been replaced with a new device (as it is the case in other SSRMs). A large surface stainless steel wet/dry deposition sampler is also installed on the roof. The verification team was told that for the moment for the collection of precipitation samples for tritium analysis the laboratory uses a plastic bucket.

With regard to laboratory tasks and equipment the verification team suggests to replace the old aerosol sampling system with a new one, in a similar way as it was done in other stations. This remark seems to be valid also for other SSRMs that were not part of this verification visit. The team also suggests replacing the plastic bucket used for collection of precipitation for tritium measurements with a more suitable device.

6.3.2.4 SSRM at LEPA Suceava

The verification team visited the regional LEPA's SSRM laboratory, in Suceava, some 100 km north-east of the Crucea uranium mining site. The LEPA employs altogether 52 staff, 14 of them in the general laboratory, and three in the SSRM, the radiological unit. One of the SSRM staff members works 8 hrs per day only for sampling tasks and as a reserve for the other departments.

SSRM Suceava is a '11 hour' type station, performing environmental radiation monitoring, sampling and measurements according to the national monitoring programme for the region. It also has a special work programme with regard to regulatory monitoring for the Crucea uranium mine site. This programme is defined together by NEPA and LEPA Suceava.

The laboratory has a new alpha/beta counter bought from the LEPA budget. The device comes from *Protean Instrument Corp.*. At the time of the verification visit, it was electrically connected, but not yet linked to the PC because the laboratory could not buy the necessary software. Thus, currently the data transfer and the calculations are done manually by the staff.

The verification team encourages the acquisition of suitable software for transmitting raw measurement data from the counting device to the PC and for analysis, with a view to avoid manual handling of data and errors associated with that.

6.3.3 Ministry of Health laboratories

According to the *Ministerial Order no. 570/2007* of the Ministry of Health (MH), regarding the technical norms for implementing, evaluation and financing of national programmes, a *national programme of prophylaxis* is in place.

In accordance with the Ministerial Order no. 1688/2004 of MH on national public health the responsible body for technical coordination and drafting the surveillance methodology for foodstuff and drinking water is the Institute of Public Health (IPH) in Bucharest.

The national public health network consists of 19 laboratories covering the entire national territory, technically coordinated by the four regional Institutes of Public Health.

Ministry of Health laboratories were not part of this verification visit.

6.3.4 Food safety laboratories

The Laboratory of Nuclear Analysis Techniques of the Institute of Hygiene and Public Veterinary Health performs measurements of radioisotopes in almost all food and feed products such as: products of animal origin: milk and dairy products, as well as meat, fish, honey; feeding stuff; forest fruit; cultivated or wild mushrooms; water used in the technological process of food processing or in animal farms; dehydrated products (additives, ingredients for food industry).

The sampling frequency is quarterly or twice a year. The samples are analysed for Cs-134 and Cs-137 in an *ANSVSA* controlled laboratory (e.g. Laboratory of Analyses through Nuclear Techniques belonging to the Institute for Hygiene and Veterinary Public Health in Bucharest). These laboratories are notified by *CNCAN* to perform such measurements, through *Notification No. LI 07/2006* (expiry date 2. April 2009).

A determination of the radioactive contamination level can also be performed at the express request of an individual. The laboratory analyses are performed by official veterinary surgeons or by state inspectors authorised for this purpose.

Food safety laboratories were not part of this verification visit.

7 NEPA-NRL RE-VERIFICATION

As a consequence of the Article 35 verification in Romania in 2007, several recommendations and suggestions with regard to NEPA-NRL were formulated (see report "Verifications under the Terms of Article 35 of the EURATOM Treaty – Cernavodă NPP and the National Network from South-eastern Romania"; Reference: RO-07/4). During the current visit the verification team paid special attention to the actions set by the Romanin authorities after that visit.

7.1. GENERAL

During the visit to the premises of NRL at NEPA Bucharest the verification team was informed that the NEPA building was still under renovation. The financial basis had been blocked; only recently the renovation work started again.

7.2. AUTOMATIC MONITORING SYSTEMS

In relation to the automatic monitoring systems in Romania the verification of 2007 stated:

> *"The verification team recommends completing and setting-up the 'new' system in an efficient and speedy way."*

The verification team was informed that – due to problems with *UIT*, the supplier, – the 'new' system is still not in routine operation. For example, the validation of data from the EWS system is not possible. Thus, sending validated data from this system to EURDEP cannot be done.

> *The verification team strongly recommends finding an effective and sustainable solution to put the automatic monitoring systems in full operation. In particular, reliable data communication to the EURDEP system should be guaranteed.*

7.3. NEPA LABORATORY NRL

In relation to the NEPA laboratory NRL the verification of 2007 stated:

> *"The verification team strongly recommends getting the laboratory fully operational as quickly as possible. This includes fixing the laboratory rooms and preparing all necessary procedures. … "*

The team was told that at the end of 2007 / beginning of 2008 some new equipment was bought for the NRL (e.g. hoods, furnace, evaporation systems, alpha spectrometry device, electro deposition system for alpha spectrometry, microwave digestor, balances). However, some chemicals that are needed for specific sample preparation are not yet available.

The team was informed that NRL has *CNCAN* authorisation as a 'nuclear unit' for closed radioactive sources but not yet for open radioactive sources. The necessary waste water treatment device is present but not yet installed.

> *The verification team strongly recommends intensifying all efforts to make the laboratory fully operational.*

8 FOOD IMPORT CONTROL FACILITIES, FOLLOW-UP

In a meeting with representatives of *CNCAN*, the Ministry of Health, the Institute of Public Health, the Institute of Hygiene and Public Veterinary Health, *ANSVSA*, and the Customs Authority the EC verification team was informed that imported foodstuffs must have a certificate concerning radioactivity levels.

Responsibilities are split between the various bodies, the *Ministerial Order 1805* of 2005 being the basis. Meetings took place with a view to draft a protocol and to standardise formats.

The current operational mechanism is the control of documents for all imports according to customs law. If the item is included in a special TARIC (*Tarif intégré des Communautés européennes*) category, customs has access to data from the sanitary authority.

Customs is entitled and able to carry out sampling of imported products; analysis of samples may include also radioactivity measurements. Qualitative radiation measurements are performed by the Sanitary Veterinary and Food Safety Directorate laboratory in Constanţa;

the customs officials at the harbour have hand-held dose rate measurement devices for alerting. Sampling can be initiated for example by a notification through the customs early warning system. Laboratory analysis takes one or two days; containers are not delayed at the harbour during the laboratory analysis. If radioactivity is found the receiver of the shipment is notified and an alert is issued to the customs rapid alert system. The procedure has been agreed and documented, but in practise Constanța customs has so far not carried out any samplings based on suspected radioactivity.

The verification team was told that the Sanitary and Veterinary laboratory is represented at eight border inspection posts.

9 CONCLUSIONS

All verifications that had been planned by the verification team were completed successfully. In this regard, the information supplied in advance of the visit, as well as the additional documentation received during and after the verification, was useful.

(1) The verification activities that were performed demonstrated that the facilities necessary to carry out continuous monitoring of levels of radioactivity in the air, water and soil around the uranium mining site at Crucea and the uranium milling and processing site at Feldioara as well as the verified parts of the national monitoring system for environmental radioactivity are adequate. The Commission could verify the operation and efficiency of these facilities.

(2) A few pertinent suggestions and recommendations are formulated. These aim at improving some aspects of discharge monitoring from, and environmental surveillance with regard to uranium production sites and the national monitoring system. The recommendations do not discredit the fact that environmental monitoring around uranium production sites as well as the verified parts of the national monitoring system for environmental radioactivity are in conformity with the provisions laid down under Article 35 of the Euratom Treaty.

(3) The Commission services ask the Romanian competent authority to inform them of any progress or significant changes with regard to the situation at the time of the verification. In particular, they will closely follow up the progress made with respect to point (2) above.

(4) Finally, the verification team acknowledges the excellent co-operation it received from all persons involved in the activities it performed.

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[signed]

C. GITZINGER

Team Leader