



EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR ENERGY
Directorate D – Nuclear Energy
D.4 – Radiation Protection

Main Findings of the Commission's Article 35 verification in Poland

Date: 29 June to 02 July 2009

Verification team: Mr. J-L. Frichet (team leader)

Mr. S. Mundigl

Ms. C. Hanot

Mr. P. Vallet

Reference of report: PL-09/05

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.

For the purpose of such a review, a verification team from DG TREN.H.4 visited the MARIA Research Reactor site located near Warsaw in Poland, as well as some laboratories which are part of the national monitoring system for environmental radioactivity. The visit included meetings with representatives of the National Atomic Energy Agency (NAEA) and the MARIA Research Reactor staff. With due consideration to the scope of the verification mission and taking into account the relatively short time available for the execution of the programme, it was agreed that emphasis would be put on the:

- Verification of the discharge monitoring (gaseous and liquid) of the MARIA Research Reactor,
- Verification of the environmental monitoring on-site and off-site of the Świerk Nuclear Centre.

The present report contains the results of the verification team's review of these relevant aspects of environmental surveillance of radioactivity on the territory of Poland.

The report is also based on information collected from documents received and from discussions with various persons met during the visit.

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

MAIN FINDINGS

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 INTRODUCTION

The Commission's decision to request the conduct of an Article 35 verification was notified to the Polish authorities on March 2009. Subsequently, practical arrangements for the implementation of the verification were made with the persons designated by the Polish authority.

2 COMPETENT AUTHORITIES AND LEGAL BACKGROUND

Poland has no nuclear programme implemented so far, but the country has several environmental issues related to radioactivity. Poland has a legal framework, in line with the 'EURATOM acquis' and the IAEA standards for ionizing radiation control.

With regard to the monitoring of environmental radioactivity the main legal instruments are the Atomic Law, with amendments, and the Regulation on stations for the early detection of radioactive contamination and units which measure radioactive contamination.

On the basis of the Atomic Law the National Atomic Energy Agency (NAEA) has been designated the main responsible organisation for the Polish monitoring programme of radioactivity in the environment. NAEA is supervised by the Ministry of Environment.

The President of the NAEA, through the Radiation Emergency Centre CEZAR, co-ordinates the monitoring of environmental radioactivity in Poland and is the Competent Authority in the field of nuclear safety and radiation protection. NAEA has the responsibility to enforce the relevant legislation.

Some other organisations involved in the national monitoring programme are:

- The Chief Sanitary Inspectorate supervises the basic units measuring radioactive contamination of the environment, agricultural products and foodstuffs. It reports to the Ministry of Health.
- The Central Laboratory for Radiological Protection (CLOR) supervises aerosol stations, performs some of the local monitoring of various media and organises inter-calibration exercises.
- The Institute of Meteorology and Water Management (IMGW) supervises the basic stations under its responsibility (IMGW stations) and reports to the Ministry of Environment.
- The Institute of Atomic Energy in Otwock-Świerk performs local site monitoring and reports to the Ministry of Economy.

3 ENVIRONMENTAL RADIOACTIVITY MONITORING

The radiological situation of the environment in Poland is monitored by systematic measurement of ambient gamma dose rate in specific places all over the country and measurements of the radionuclide content in primary components of the environment, food and feedstuffs. The system is divided into:

- A national monitoring, providing essential data for evaluation of the radiological situation all over the country under normal conditions and in emergency situations;
- A local monitoring, providing data from areas where activities causing a potential increase in radiation exposure of the local population are (or were) conducted. This

refers to the Institute of Atomic Energy in Świerk, the National Radioactive Waste Repository in Różan and the former Uranium Mining Company in the vicinity of the town Jelenia Góra (the main mining having been in the small town Kowary).

Measurements within the national and the local monitoring system are performed by:

- stations (= measuring devices) for early detection of radioactive contamination (early warning stations);
- Basic units (= small laboratories) measuring radioactive contamination of environmental materials, food- and feeding stuffs;
- Specialized units (= large laboratories) of research & development organizations, universities and other institutions performing special measurements.

Every year, the basic and the specialized units take part in inter-calibration exercises organised by the NAEA President.

4 VERIFICATION ACTIVITIES AT THE MARIA RESEARCH REACTOR

The Maria Research Reactor is situated inside the Świerk Nuclear Research Centre, near Otwock, at around 30 kilometres south-east of Warsaw. The reactor is a pool type reactor with a nominal power of 30 MW_{th}. It was built in the 1970s. For the reactor there are no special legislative acts regulating radioactivity releases to the environment and its monitoring. It is working under a license issued by the President of the NAEA, which is valid until 31 March 2015.

The reactor at the MARIA Research Reactor Site is operated by the Institute of Atomic Energy. This institute is responsible for the organization of the environmental radioactivity monitoring system connected with this site ("on site" in the reactor buildings and environmental radioactivity monitoring "off site").

The license states that releases to the atmosphere through the reactor stack are restricted to 1.0 10¹⁵ Bq/a for noble gases and 5.0 10⁹ Bq/a for all isotopes of iodine (including aerosols).

The MARIA Research Reactor does not have an individual authorisation for liquid discharges. Liquid discharges from the MARIA Research Reactor are transferred to the Department of Waste Management of the Świerk Nuclear Research Site.

The Świerk Nuclear Research Centre has a license to release liquid discharges with a total activity of up to 2.6 GBq/week provided that activity concentrations of discharges stay below 3.7 kBq/l.

Gaseous and volatile radioactive releases through the reactor stack are continuously monitored in a bypass (radioactive noble gases; gamma dose rate; iodine isotopes; aerosols).

Additionally, some of the filters of these systems are analysed in the laboratory in order to allow nuclide specific accounting of aerial discharges.

The verification team could check the continuous measurement of the systems.

Contaminated liquids are collected in a tank. After sampling and analysis by gamma spectrometry, the measurement results are sent to the Department of Waste Management located in the area; this body is responsible for all liquid discharges from the whole Świerk research site.

The verification team visited the sewage system of the Świerk Nuclear Research Centre and assisted at the weekly sampling of a water probe at the discharge tank and the subsequent analysis of the sample.

All values from the continuous stack monitoring system and other measuring devices located in the reactor building are transmitted to the dosimetry system in the Main Radiation Control Room. The team received an explanation and a presentation of this system.

The verification team visited the operator's laboratory for discharge samples. The primary purpose of the laboratory's analysis programme is to estimate the total radiation dose due to aerial discharges received by a member of the public in the surroundings of the Research Reactor. The laboratory also analyses the 'discharge' tank samples.

With regard to gaseous and liquid discharges, the Main Radiation Control Room and the operator's laboratory for discharge samples the verification does not give rise to recommendations.

4.1. CONTROL BY REGULATOR

The National Atomic Energy Agency (NAEA; the regulator) does not have its own monitoring programme of the discharges of the Świerk reactor. It supervises the measurements conducted by the operator. NAEA quarterly receives data concerning aerial discharges. In case of an excess of the limits imposed by NAEA, the operator is obliged to immediately inform the regulator.

The verification team supports all necessary steps to implement an efficient control system by the regulator.

4.2. ON-SITE INSTALLATIONS FOR RADIATION PROTECTION (RADIATION PROTECTION MEASUREMENTS LABORATORY – RPML)

The Radiation Protection Measurements Laboratory (RPML) is responsible for the radiation protection programme at the Institute of Atomic Energy, in the vicinity of the Świerk Nuclear Centre and at the National Repository of Radioactive Waste at Rózan.

The verification team was invited to visit the Central Monitoring System which is in place to monitor the Świerk Nuclear Centre consisting of 13 intelligent gamma probes for background measurements, two intelligent gamma probes for personal gate measurements, five intelligent gamma probes for water measurement, two air monitoring stations, and a meteorological station, all connected to a control panel.

The verification team visited the certified calibration laboratory where all equipment for radiation measurements is being calibrated.

The verification team visited also the facilities for in-vivo measurements of incorporated radionuclides consisting of a whole body counter and a thyroid counter. The Radiochemistry Laboratory of RPML is accredited by the Polish Centre for Accreditation.

The verification team focused on the environmental radioactivity monitoring programme in the area and in the vicinity of the Świerk Nuclear Centre. The programme performed by the laboratories of RPML covers the analysis of the following types of samples: air (for aerosols), drainage water, well water, river water, process water, precipitation, mud, milk, soil, cereals and grass.

Verification activities with respect to the on-site environmental monitoring programme, sample preparation, measurements, record keeping and quality control at the Contamination Measurements Department do not give rise to particular remarks.

4.3. OFF-SITE ENVIRONMENTAL MONITORING

Environmental radioactivity monitoring off-site concerns an area comprising the whole site of the Świerk research centre and its vicinity (in a perimeter of 200 km). In radiological terminology this territory is named the 'surveillance area'. The monitoring is carried out by the Radiation Protection Measurements Laboratory (RPML) (see above).

In addition, part of the national monitoring system for environmental radioactivity is located in this area.

Institute of Applied Radiation Chemistry, Faculty of Chemistry, Technical University of Łódź

The verification team visited the Institute of Applied Radiation Chemistry, Faculty of Chemistry of the Technical University of Łódź, where a Permanent Monitoring Station (PMS) for ambient gamma dose rate measurement and a High Volume air sampler are located.

The PMS station is located on the premises of the technical university. Measurement values are transmitted to centres in Warsaw.

The verification activities with respect to the measurement and sampling station do not give rise to particular remarks.

Sanitary Inspection (WSSE) – local laboratory in Łódź

The Sanitary Inspection Stations (WSSE) belong to the Health Ministry and are responsible for the safety of the environment and of the population.

The verification team visited the WSSE laboratory in Łódź and verified the presence and operability of the laboratory instruments.

Verification activities with respect to sample reception, encoding and preparation do not give rise to particular remarks.

The verification team emphasises that NaI(Tl) based gamma spectrometry is a low resolution application. It is reasonably suited for the measurement of single nuclides showing few peaks.

Institute of Meteorology and Water Management in Warsaw

In Poland several measuring and sampling stations are operated by local bodies of the Institute of Meteorology and Water Management. The verification team visited the central institute in Warsaw, which offers products in the field of meteorology, hydrology and water management to a variety of customers including the public, the government (central and regional administrations), economy and others. The team visited the laboratory and verified the presence and operability of the laboratory instruments.

The verification activities with respect to the measurements and the sampling procedures do not give rise to particular remarks.

5 CLOR - DRINKING WATER MONITORING - VERIFICATION

As a result of the previous Article 35 mission to Poland (13 to 17 November 2006) the verification team that visited CLOR (Centralne Laboratorium Ochrony Radiologicznej - Central Laboratory for Radiological Protection, Warsaw) pointed out that for drinking water, no routine monitoring programme was in place. Since then, a drinking water programme has been implemented by CLOR, financed by the National Atomic Energy Agency. Thus, the EC team visited CLOR to verify what has been done in the frame of monitoring of drinking water.

The current monitoring programme includes the determination of the activity concentration of tritium, gross alpha, gross beta, Cs-137 and Sr-90 in water intended for human consumption in larger urban agglomerations.

The verification team visited the laboratories dealing with the measurements.

The verification activities with regard to the drinking water programme do not give rise to recommendations.

6 CONCLUSIONS

All verifications that had been planned by the verification team were completed successfully. The information provided and the outcome of the verification activities led to the following observations:

- (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 in the visited regions in Poland were in place. The Commission could verify the operation and efficiency of these facilities.
- (2) With regard to regulatory surveillance of the MARIA Research Reactor at Świerk the verification team supports preparing and implementing all necessary steps to improve the control system. This does not discredit the fact that environmental monitoring in the visited regions in Poland is in conformity with the provisions laid down under Article 35 of the Euratom Treaty.

Finally, the verification team acknowledges the excellent co-operation it received from all persons involved.

[signed]

J.-L. Frichet