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## Main Findings of the Commission's Article 35 verification in Portugal.

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

For the purpose of such a review a delegation from European Commission visited, between the 20<sup>th</sup> and the 24<sup>th</sup> of November 2006:

1. The Nuclear and Technology Institute (Instituto Tecnológico e Nuclear – ITN) operating the Portuguese Research Reactor (Reactor Português de Investigação – RPI) at its Sacavém campus, near Lisbon. The Sacavém campus also houses the Department for Radiological Protection and Nuclear Safety (Departamento de Protecção Radiológica e Segurança Nuclear - DPRSN).

The scope of the review was to provide independent verification of the adequacy of:

- The monitoring facilities for gaseous and liquid discharges of radioactivity from the Portuguese Research Reactor into the environment.
- The analytical laboratories for effluent sample measurements.
- The monitoring facilities for levels of environmental radioactivity on the Sacavém campus and on its perimeter.
- The analytical laboratories for environmental sample measurements.
- Within the time available, and to the extent possible, the environmental radioactivity monitoring programme for the marine, terrestrial and aquatic environment in Portugal.

The verification team focussed in particular on the degree of implementation of the recommendations that resulted from the Article 35 verification activities performed in 2002.

2. The Environment Institute (Instituto do Ambiente) at Lisbon to verify the operation and efficiency of the RADNET national radiological early warning network.

3. The former Urgeiriça uranium mine, near the city of Viseu, where it could verify the local radiological surveillance programmes and where it was briefed on the national plan for the remediation and rehabilitation of former uranium mines.

Finally, in the margin of the visit certain legal matters were discussed with the Portuguese authorities. To a large extent these discussions had a bearing on the licensing of the RPI and its related discharge authorisation.

## **MAIN FINDINGS**

The Portuguese authorities proposed a verification programme covering all matters in which the Commission had expressed special interest.

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

The results of the verification activities performed give rise to the following main observations and recommendations that are addressed to the Portuguese competent authorities.

### **1. The Portuguese Research Reactor**

#### **1.1 Discharge control of radioactive effluents and site-related radiological surveillance**

The verification activities demonstrated that the facilities necessary to carry out continuous monitoring of radioactive discharges from the RPI are adequate. The Commission could verify the operation and efficiency of these facilities. The recommendations made after the 2002 verification visit were given appropriate response.

The verification activities demonstrated that the facilities necessary to carry out continuous monitoring of levels of radioactivity in the air, water and soil around the RPI are adequate. The Commission could verify the operation and efficiency of these facilities. Nearly all the recommendations made after the 2002 verification visit were given appropriate response.

The verification team notes with satisfaction that the recommendations made in 2002 have encouraged the ITN to make significant efforts in improving the airborne and liquid discharge monitoring capabilities and related quality assurance aspects.

However, some topical recommendations remain to be formulated. These recommendations aim at achieving improvements and do not discredit the fact that the radiological surveillance of the RPI is in conformity with the provisions laid down under Article 35 of the Euratom Treaty.

These recommendations are as follows:

- The verification team welcomes the plans to put in place a guaranteed power supply for the radiological surveillance systems in the stack of the RPI.

*It is recommended that this system be commissioned before the end of the year 2007.*

- The verification team welcomes the commissioning of a new monitoring system for liquid discharge control before final release into the environment. This new system, operated by the DPRSN, completely replaces the former methodology consisting of laboratory measurements on pre-discharge samples. The team however believes that it would be beneficial from a quality assurance and control perspective, should the operator conduct a reassurance sampling and laboratory analysis programme.

*It is recommended in the framework of general quality control that a temporary sampling and laboratory analysis programme be put in place to provide reassurance about the reliability of the new monitoring system controlling the final discharge tank for liquid effluents. Subsequently a laboratory control measurement should be performed at regular intervals.*

- The verification team noted that the functionality of the level indicators on the final discharge tank had not been restored since the last visit. However, information was provided indicating that remedial action is foreseen. This, combined with the finding that a new discharge control system had been commissioned, leads to a reformulation of the recommendation issued in 2002:

*It is recommended that the final discharge tank for liquid effluents, as a matter of priority, be equipped with level indicators and flow meters. Such devices, in conjunction with the new monitoring system, will allow a more accurate and therefore less conservative assessment of the activity discharged into the environment.*

- The verification team noted that the 2002 recommendation on the implementation of quality controlled operating instructions for liquid discharge procedures was not yet fully completed. This, combined with the finding that a new discharge control system had been commissioned, leads to a reformulation of the recommendation issued in 2002:

*It is recommended that, for quality assurance and control purposes, written procedures are established for the operation, maintenance and calibration of the new monitoring system controlling the final discharge tank for liquid effluents.*

- Finally, the verification team endorses the ongoing and/or planned improvement works on the sampling and monitoring capabilities for airborne and liquid discharges of activity into the environment.

*It is recommended that ITN management provide all such means as are necessary to ensure that the current and planned improvement works, in particular those at the final discharge tank for liquid effluents, can be carried out without undue delays.*

## 1.2 The analytical laboratory for discharge samples operated by the DPRSN

The verification activities demonstrated that the recommendations made after the 2002 verification visit were given appropriate response and that considerable improvements have been achieved in matters of quality assurance and control.

- However, it was noted that the client versus service provider relationship between the RPI and the DPRSN, where it concerns the analysis of RPI liquid effluent samples, could benefit from a more rigorous and transparent definition.

*It is recommended that the management of the RPI, where it concerns the liquid effluent samples from the RPI, revises the current client versus service provider relationship modalities it has with the DPRSN, to the effect of clearly specifying the object and deliverables of the service required, including aspects of quality assurance and control.*

### 1.3 Regulatory control of the Portuguese Research Reactor

The Directorate-general for Geology and Energy (the "Direcção-Geral de Geologia e Energia" – DGGE), as licensing authority, does not have in place provisions for an independent regulatory control and enforcement of the operator's statutory obligations; more in particular where it concerns airborne and liquid discharges of activity into the environment.

The monitoring of the site's final discharge tank for liquid effluents, as conducted by the DPRSN, is operational in its nature and cannot be considered as independent monitoring of the source term (liquid effluents from the RPI) by a regulatory authority.

The site-related environmental monitoring as operated by the DPRSN, addressing the surveillance of airborne discharges from the RPI cannot be considered as independent monitoring of the source term by a regulatory authority.

- *It is recommended that the licensing authority brings into effect a system that allows independent and formal validation of the quality assurance and control that underlies the operator's reporting on the amounts of radioactivity discharged into the environment.*

## **2. The DPRSN environmental laboratory and the scope and conduct of the national environmental monitoring programme as implemented by the DPRSN**

Since the 2002 verification visit and ensuing recommendations, noteworthy improvements have been achieved. These efforts have been translated into a new organizational structure to optimize the existing competencies; the implementation of quality control programmes; the acquisition of new equipment and associated software; the development of new techniques and measuring methodologies and expansion of the environmental monitoring programme.

In May 2006 the DPRSN submitted to the Portuguese Accreditation Institute (IPAC) an application for accreditation of the analytical and measurement techniques implemented in different units of the Department. The verification team endorses this initiative and encourages the DPRSN to maintain its efforts in completing all procedures necessary to achieve full certification of the laboratory.

The establishment in 2005 of a legal framework for radiological environmental monitoring by Decree-Law N°138/2005, largely reflecting Commission Recommendation 2000/437/EURATOM, has contributed to the development of a comprehensive national environmental monitoring programme, both for the dense and sparse networks.

The verification activities demonstrated that the facilities necessary to carry out continuous monitoring of the level of radioactivity in the air, water and soil on the territory of Portugal

are adequate. The Commission could verify the operation and efficiency of a number of these facilities. The recommendations made after the 2002 verification visit were given appropriate response.

- However, one of these recommendations needs to be maintained. It should be noted that the nature of this recommendation does not discredit the fact that the national environmental monitoring programme is in line with the provisions laid down under Article 35 of the Euratom Treaty.

*It is recommended, in order to achieve representativeness, that river water samples be taken over defined periods of time and that river flow rates be recorded during this period.*

### **3. The national early warning network (RADNET) operated by the IA**

The verification activities that were performed demonstrated that the facilities necessary to carry out continuous monitoring of gamma dose rates in air in Portugal are in general adequate. The Commission could verify the operation and efficiency of these facilities.

The verification team endorses the initiative of the "Instituto do Ambiente" (the Environment Institute) to gradually replace the dose rate monitoring devices currently in use so as to achieve and ensure enhanced availability of the network (replacements expected to be finalised within the next three years).

- However, a recommendation has to be formulated to the effect that the radiological surveillance through aerosol monitoring should be covered by a quality assurance and control programme. The implementation thereof should not be postponed until the replacement of the associated gamma dose rate monitoring devices.

*It is recommended that the IA put in place a comprehensive data quality assurance and control programme for the RADNET aerosol monitoring systems. Such a QA programme, including regular calibration controls, may become integral part of an outsourced maintenance contract on condition that the deliverables are well defined and supported by documented procedures.*

### **4. Radiological surveillance around former uranium mines**

The verification team welcomed the extensive briefing it received on the national plan for the remediation of former uranium mines and associated aspects of radiological protection.

The verification activities demonstrated that the facilities necessary to carry out continuous monitoring of levels of radioactivity in the air, water and soil around the Urgeiriça mine are adequate. The Commission could verify the operation and efficiency of these facilities.

The verification team endorses the initiative of the DPRSN to conduct a specific and systematic radiological surveillance programme in the former uranium mining region of Portugal.

- However, with respect to the initiative of the DPRSN:

*It is recommended that the radiological surveillance the DPRSN intends to conduct in the former uranium mining region be fully integrated in the national monitoring programme.*

*It is also recommended that such means are foreseen by the competent ministry as to ensure the continuity of the radiological surveillance of the former uranium mining region by the DPRSN.*

- The verification team noted the absence of data exchange on matters related to radiation protection between the company in charge of the implementation of the national plan for the remediation of former uranium mines (the "Empresa de Desenvolvimento Mineiro SA") and the DPRSN

*It is recommended that both the DPRSN and EDM consider the potential benefit that would arise from a systematic and formal exchange of acquired surveillance data, once the DPRSN has set up its monitoring programme in the mining region.*

## **5. Final remarks**

The European Commission would appreciate being kept informed about the remedial actions that the Portuguese authorities may undertake in the framework of the above recommendations.

The Commission would also appreciate being regularly kept abreast by the Portuguese authorities on the progress made with the implementation of the national plan for the remediation of former uranium mines.

The verification team acknowledges the excellent co-operation it received from all persons involved in the activities it performed.

*[signed]*

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Head of Mission