



Main Findings of the Commission's Article 35 Verification in Greece

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Verification team:	Mr C. Gitzinger (team leader) Mr S. Van der Stricht Ms A. Godeanu Metz
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INTRODUCTION

Article 35 of the Euratom Treaty requires that each Member State shall establish the 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.

The main purpose of verifications performed under Article 35 of the Euratom Treaty is to provide an independent assessment of the adequacy of monitoring facilities for:

- Liquid and airborne discharges of radioactivity into the environment by a site (and control thereof).
- Levels of environmental radioactivity at the site perimeter and in the marine, terrestrial and aquatic environment around the site, for all relevant exposure pathways.
- Levels of environmental radioactivity on the territory of the Member State.

For the purpose of such a review a verification team from the European Commission visited the Greek Atomic Energy Commission (GAEC) and the National Centre for Scientific Research "Democritos" (NCSR), more in particular the latter's Institute of Nuclear Technology & Radiation Protection (INT-RP) that operates the Greek Research Reactor (GRR). The verification activities took place from 12 to 16 September 2005.

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

- The statutory monitoring and control facilities for gaseous and liquid discharges of radioactivity from the Greek Research Reactor into the environment.
 - The analytical laboratories for effluent sample measurements.
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- The monitoring facilities for levels of environmental radioactivity around the Greek Research Reactor, for all relevant exposure pathways.
- The analytical laboratories for environmental sample measurements.
- Within the time available, and to the extent possible, part of the environmental radioactivity monitoring programme for the marine, terrestrial and aquatic environment in Greece.

At the same time the review addressed the follow-up given by the GAEC to the recommendations that were made after the verification that took place in the year 2000.⁽¹⁾

The present report gives an overview of the main findings and corresponding recommendations of the verification team.

These recommendations are addressed to the Greek competent authority, the GAEC.

MAIN FINDINGS

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.

1. Main findings with respect to the operator's radioactive discharge monitoring programme, the analytical laboratory for sample measurements, as well as related regulatory control

The verification activities performed at the facilities for monitoring and sampling of liquid and airborne discharges of radioactivity into the environment:

- 1.1 Confirmed the existence and functionality of monitoring and sampling facilities as defined in the regulatory obligations.
- 1.2 Confirmed that discharges of airborne radioactivity are monitored and sampled in accordance with regulatory obligations.
- 1.3 Established that the monitoring and sampling facilities are adequate and that the sampling programme for liquid and airborne discharges is satisfactory.
- 1.4 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.
- 1.5 Established that the analytical laboratory is well equipped and staffed with adequately trained personnel.

¹ The previous verification under Article 35 in Greece took place in May 2000 and resulted in a number of recommendations from the European Commission to the Greek competent authorities. The Main Findings of the May 2000 verification can be found on:
http://europa.eu.int/comm/energy/nuclear/radioprotection/verification_en.htm

Follow-up of the recommendations made in 2000:

- 1.6 The recommendation to the effect that the GAEC should investigate the operational shortcomings of the particulate monitoring system of the GRR and to consider undertaking remedial action has been satisfactorily implemented. The complete airborne discharge monitoring and sampling system has been transferred to an appropriate and secure location. Operational control over the systems is now well mastered.
- 1.7 The recommendation to the effect that the GAEC should consider upgrading the computer hardware upon which the GRR discharge control and monitoring systems are based has been satisfactorily implemented. All hardware and software components have been replaced and are now in line with modern standards.
- 1.8 The recommendation to the effect that the GAEC should consider fitting the liquid discharge delay tanks with a continuous monitoring device alarming the operator in case of an activity threshold transgression: where in the past the operator was fully responsible for discharging liquid effluents into the environment (the public sewer), this responsibility has now been transferred to the regulator insofar that the latter has to formally authorise all the discharge requests submitted by the operator. Considering that the procedure of spot sampling the discharge delay tanks is a reassurance sampling outside the domain of discharge control proper, the modified discharge control procedures are a satisfactory response to the recommendation.
- 1.9 The recommendation to the effect that the GAEC should consider the implementation of a control measurement programme for the atmospheric and liquid radioactive discharges from the GRR has been partially implemented. Room for improvement was found to be available and leads to recommendations as made under section 1.11 below.
- 1.10 The recommendation to the effect that the GAEC should clarify the role, powers and independent status of the regulatory authority (the GAEC) with respect to the operator of the GRR, more in particular where authorisation, prior authorisation of discharges, justification and inspection are concerned, has been satisfactorily implemented. The GRR is now operating in accordance with its Radiation Protection Regulation (RPR - enforced on 25 August 2005). The RPR is an implementation document describing the internal rules that shall be abided by in order to be compliant with national legislation governing the protection against ionising radiation. The national legislative act that is transposed into the RPR is Ministerial Decision No 1014 (FOR) 94 "Radiation Protection Regulations", itself transposing EU Council Directive 96/29/EURATOM (Basic Safety Standards) and Council Directive 97/43/EURATOM (medical exposure) into national law.

Findings related to the 2005 verification activities:

1.11 With respect to point 1.9 above:

1.11.1 It was noted that decay tank samples taken by the Waste Management Laboratory, after having been prepared and measured, are forwarded on an ad-hoc

basis to the GAEC for independent measurement and cross-checking of the results obtained (on average two times a year). The sampling itself and the sample preparation procedures are however not witnessed (ad-hoc validation) by the regulator. The verification team believes that if a full scope regulatory control is to be performed, it should include a verification/validation of all stages of the sampling and subsequent analytical procedures.

It is recommended, in order to ensure full regulatory control, that whenever the GAEC decides to perform a check-measurement on a decay tank sample, this be accompanied by a validation of the sampling procedure and sampling preparation as performed by the operator.

1.11.2 It was noted that the GAEC does not take samples (or shares samples with the GRR operator) to independently assess the validity of the airborne discharge data that are statutorily transmitted by the operator.

It is recommended that the practice of cross-checking liquid effluent samples as described under 1.11.1 above also be applied to airborne effluent samples in order to complement the current control programme that mainly consists of intermittent site-related environmental monitoring activities.

1.12 With respect to the handling of analytical results (of discharge samples) below measurement systems' detection limits: it is reminded that the European Commission issued Recommendation 2004/2/Euratom ⁽²⁾ wherein substitution rules for values below the detection limit are presented. Such rules are proposed to avoid unnecessary over- or underestimation of discharged activities. These substitution rules are in line with ISO standard 11929-7:2005.

It is recommended that the GAEC consider the benefits of revising its regulatory requirements for substitutions of analytical results below detection limits by bringing these requirements in line with Commission Recommendation 2004/2/Euratom and ISO standard 11929-7.

2. Main findings with respect to the operators' environmental monitoring programme and the analytical laboratory for sample measurements

The verification activities performed at the facilities for monitoring and sampling the environment on and around the GRR site:

- 2.1 Confirmed the existence and functionality of the monitoring and sampling facilities as defined in the regulatory obligations.
- 2.2 Confirmed that the levels of radioactivity in the environment are monitored and sampled in accordance with regulatory obligations.
- 2.3 Established that the monitoring and sampling facilities are adequate and that the sampling programme is satisfactory.

² Official Journal L 002, 06/01/2004 P. 0036 - 0046

- 2.4 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.
- 2.5 Established that the analytical laboratory is well equipped and staffed with adequately trained personnel.
- 2.6 *The verification activities performed do not give rise to any specific recommendation.*

3. Main findings with respect to the national environmental monitoring programme, as implemented by the GAEC Environmental Radioactivity Monitoring Department

- With respect to the Telemetric Radioactivity Monitoring Network that is operated by the Environmental Radioactivity Monitoring Department (ERMD) of the GAEC, the verification activities performed:

- 3.1 Established that the scope of the Telemetric Radioactivity Monitoring Network is satisfactory and that the network is equipped with state-of-the-art on-line monitoring devices.
- 3.2 Established that the ERMD is well equipped and staffed with adequately trained personnel.
- 3.3 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.
- 3.4 *The verification activities performed do not give rise to any specific recommendation.*

- Follow-up of the recommendations made in 2000, with respect to the environmental monitoring and sampling stations not belonging to the telemetric network:

- 3.5 The recommendation to the effect that, at the N-Philadelphia station, various monitors and sampling devices be located in areas free of possible sources of interference (abundant vegetation etc.) has been satisfactorily implemented.
- 3.6 The recommendations to the effect that (a) the GAEC should restore the air sampling capabilities at the N-Philadelphia station and ensure that deposition-sampling activities are performed according to procedures as well as (b) that the GAEC should consider replacing the existing air sampler and deposition collector with devices in line with modern standards have been partially implemented. See section 3.7 below.

Findings related to the 2005 verification activities:

- 3.7 With respect to point 4.6 above:

- 3.7.1 In relation to the N-Philadelphia air sampling system: a new sampling system was commissioned on the campus of the National Centre for Scientific Research to replace the absence of monitoring capabilities at the N-Philadelphia environmental monitoring station. The new system is in line with modern standards.

The verification team believes that one system suffices to adequately cover the Attiki area.

3.7.2 In relation to the deposition collectors: the same rudimentary and inappropriate devices that were in place in 2000 are still used.

Therefore the year 2000 recommendation is re-iterated:

It is recommended that the GAEC consider replacing all the deposition collectors belonging to the national radiological environmental monitoring programme with devices in line with modern standards.

- Follow-up of other recommendations made in 2000:

3.8 The recommendations to the effect that (a) the GAEC should formalise the distribution of responsibilities [with respect to the implementation of the national environmental radioactivity monitoring programme] between itself and the ERL laboratory [of the INT-RP] and that (b) the GAEC should ensure that any part of the activities of the programme it may intend to devolve to third parties be duly formalised, have been satisfactorily implemented. The GAEC being responsible for organising the programme has formal collaboration agreements with 10 laboratories operated by Greek research institutes or universities, of which the ERL is the major contributor.

3.9 The recommendations to the effect that the GAEC should consider inheriting the electronic archive of the ERL laboratory [containing the historical data of the national environmental radioactivity monitoring programme] so as to preserve continuity of knowledge on environmental data and hence ensure follow-up and evaluation capabilities has been satisfactorily implemented. The GAEC Radiation Protection Database capabilities have been expanded to accept environmental data that are now routinely incorporated. Historical data have been transferred as of the year 1990.

4. Main findings with respect to the national environmental monitoring programme, as implemented by the Environmental Radioactivity Laboratory of the Institute for Nuclear Technology and Radiation Protection

The verification activities focussed on the laboratory-based part of the national environmental monitoring programme, as performed by the Environmental Radioactivity Laboratory (ERL) of the Institute for Nuclear Technology and Radiation Protection, on behalf of the GAEC.

The verification activities performed:

4.1 Established that the scope of the programme is satisfactory.

4.2 Established that the ERL is well equipped and staffed with adequately trained personnel.

- 4.3 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.
- 4.4 *The verification activities performed do not give rise to any specific recommendation.*

CONCLUSIONS

- 5.1 The verification visit was successful and the objectives of the review were met. Within the remit of verification activities under Article 35 of the Euratom Treaty it has been demonstrated that the facilities necessary to carry out continuous monitoring of levels of radioactivity in the air, water and soil around the Greek Research Reactor site and on the territory of Greece are adequate. The Commission could verify the operation and efficiency of these facilities.
- 5.2 However, some shortcomings were noted and lead to recommendations by the Commission to the Greek competent authority with the aim to achieve improvements. It should be noted that these recommendations do not discredit the fact that radiological environmental monitoring in Greece is in conformity with the provisions laid down in Article 35 of the Euratom Treaty.
- 5.3 The Commission would appreciate being kept informed about the actions the Greek competent authority may undertake in the framework of the recommendations made.
- 5.4 Finally, the verification team acknowledges the excellent co-operation it received from all persons involved.

[signed]

C. GITZINGER

Team Leader