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DIRECTORATE-GENERAL ENERGY AND TRANSPORT

Directorate H – Nuclear Energy
Radiation protection

Main Findings of the Commission's Article 35 verification in Sweden
Forsmark Nuclear Power Station
National Environmental Radioactivity Monitoring

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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 the 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 site of the Forsmark Nuclear Power Station located on the Swedish east coast about 4 km north of Forsmarks Bruk in Östhammar Municipality in Uppsala County, from 9 to 12 February 2009. The aim of the verification was to check the operation and efficiency of the facilities and associated analytical laboratories for continuous monitoring of the level of radioactivity in air, water and soil in the vicinity of the Forsmark site and on the territory of Sweden. The verification scope also covered the on-site facilities monitoring liquid and aerial discharges of radioactivity into the environment. With due consideration of the scope of the verification mission and taking into account the relatively short time available for the execution of the programme, emphasis was put on:

1. Discharge monitoring at Forsmark NPP;
2. The structure of the national environmental monitoring and sampling programme;
3. The analytical laboratories at Forsmark NPP and SSM;
4. Automatic monitoring systems and environmental sampling arrangements at selected locations.

The team carried out verifications of monitoring systems and sampling facilities at several locations in Forsmark NPP and the surrounding area. These verifications covered both on-line and off-line environmental and foodstuffs radioactivity monitoring provisions.

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

Recommendations are addressed to the Swedish competent authority, the Swedish Radiation Safety Authority (SSM).

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. Main findings with respect to the discharge monitoring at Forsmark NPP

The verification activities performed at the Forsmark NPP:

- 1.1 Confirmed the existence and functionality of the discharge monitoring and sampling programme, as defined in the regulatory obligations.
- 1.2 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.

However,

- 1.3 With respect to the point 1.2 above, the verification team noted that there was no sampling instruction available at the liquid effluent release tank pre-sampling station.

Verification team recommends making sure there is a written sampling instruction available at each sampling station.

2. Main findings with respect to the structure of the national environmental monitoring and sampling programme

The verification activities performed at the Swedish Radiation Safety Authority (SSM) and the National Defence Research Agency (FOI):

- 2.1 Confirmed the existence and functionality of the national environmental monitoring and sampling programme, covering the Swedish territory as defined in the regulatory obligations.
- 2.2 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.

Verification does not give rise to recommendations.

3. Main findings with respect to the analytical laboratories at the Forsmark NPP and the SSM

The verification activities performed at the analytical laboratories of the Swedish Radiation Safety Authority and the Forsmark NPP:

- 3.1 Established that the laboratories are well equipped and staffed with adequately trained personnel.
- 3.2 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.

However,

- 3.3 With respect to the point 3.2 above the verification team noted that none of the associated laboratories is formally accredited for radioactivity measurements.

The verification team suggests that the laboratories should proceed towards a formal accreditation.

- 3.4 With respect to the point 3.2 above the verification team noted that there appears to be no formalised policy for reporting values below the Minimum Detectable Activity (MDA) in Sweden and there has been no regulatory guidance on the required instrument sensitivity. In Forsmark the policy is to report zero if the measured value is below the MDA of the system.

Verification team recommends that the SSM considers the benefits of revising its regulatory requirements for substitutions of analytical results below MDA by bringing these requirements in line with the Commission Recommendation 2004/2/Euratom and ISO standard 11929-7:2005.

- 3.5 With respect to the point 3.2 above the verification team noted that at the Forsmark F3 laboratory one of the efficiency stability tests indicated unusually large variations in HPGe detector efficiency.

Verification team recommends making sure the HPGe-detector efficiency stability test procedure at the F3 laboratory is adequate and the stability of each detector is thoroughly controlled.

- 3.6 With respect to the point 3.2 above the verification team noted that at the SSM laboratory some of the measurement instructions were handwritten and there appeared to be no systematic documentation for the measurement procedures.

The verification team recommends that the SSM analytical laboratory creates a formalised system of measurement and calibration instructions as a part of a comprehensive quality system and thereafter proceeds towards a formal quality accreditation.

The verification team suggests SSM to consider setting up a computer database for sample management at the laboratory. This is particularly important if the number of incoming samples should increase for any reason.

4. Main findings with respect to the automatic monitoring systems and environmental sampling arrangements

The verification activities performed in Stockholm, Gävle and Alunda:

- 4.1 Confirmed the existence of a national on-line and off-line monitoring system and sampling provisions.
- 4.2 Established that the monitoring network is satisfactorily equipped and maintained.

- 4.3 Established that quality assurance and control is implemented through a compilation of written procedures and working instructions.

However,

- 4.4 With respect to the point 4.2 above the verification team noted that the current network is old and a modernisation project is being implemented.

Verification does not give rise to recommendations. The verification team supports the modernisation of the automatic dose rate monitoring network.

CONCLUSIONS

The verification visit was successful and the objectives of the review were met. Within the remit of verification activities under the 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 on the territory of Sweden and the monitoring of radioactive discharges from Forsmark NPP are adequate. The Commission could verify the operation and efficiency of these facilities.

A few recommendations and suggestions have been formulated, mainly in relation to laboratory practice and general quality assurance. These recommendations do not detract from the general conclusion that the Swedish national monitoring network 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.

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