MONITORING STRATEGY FOR THE ATMOSPHERIC COMPARTMENT IN EUROPE

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The Euratom Treaty, which came into force on 1 January 1958, and most notably Article 35 thereof, is the defining legal basis for monitoring of radioactivity in Europe. It states that "*Each Member State shall establish the facilities necessary to carry out continuous monitoring of the level of radioactivity in the air, water and soil and to ensure compliance with the basic standards. The Commission shall have the right of access to such facilities: it may verify their operation and efficiency".*

Given the importance of air for life on earth it is imperative that it is continuously monitored. Whilst water and soil are regularly monitored they cannot be monitored 24/7 in the way that air can.

In 2000 a Commission Recommendation (2000/473 Euratom) on the application of Article 36 of the Euratom Treaty concerning the monitoring of the levels of radioactivity in the environment for the purpose of assessing the exposure of the population as a whole recommended that external ambient gamma dose rates be measured continuously.

2015 marked a milestone for the Commission's Joint Research Centre (JRC) celebrating 20 years since the EUropean Radiological Data Exchange Platform (EURDEP) came into existence. EURDEP facilitates the transmission of large datasets from environmental radioactivity and emergency preparedness monitoring networks. It makes radiation dose rate data from 39 European countries, from about 5500 automatic stations available on an hourly basis and in addition from some 100 air concentration monitoring stations on a daily basis during an emergency, as well as under normal conditions. On a global level, the JRC assists the International Atomic Energy Agency (IAEA) in developing its International Radiation Monitoring Information System (IRMIS), which was recently adopted on the basis of the EURDEP system.

Since 1994 over 100 verification missions have been undertaken by the European Commission under Article 35, covering many facets of the radioactive monitoring undertaken, whether as part of the national network, related to particular installations (notably NPPs) or specific topics such as former uranium mining facilities. Since 2015 the focus has been on monitoring in large cities. Naturally great importance is attached to air monitoring during these verification missions. Three forms of monitoring of the atmospheric compartment are commonly found:

- Gamma dose rate monitoring, using the most common instrument, the Geiger-Muller (GM) counter, or the NaI scintillator, both of which give instantaneous results which can notably be uploaded to EURDEP. Newer instruments, using for instance a $LaBr_3$ spectrometer allow identification of the radionuclides.
- Airborne particulate sampling using low, medium and high volume pumps which draw air through a filter for later analysis in the laboratory. A new generation of samplers can carry out the analysis in real time.
- Wet or dry deposition collectors which collect particulates for subsequent analysis in a laboratory.

These missions are widely welcomed by the Member States concerned and have contributed greatly to the understanding of the various types of monitoring programmes carried out in Europe. As appropriate, in some cases suggestions or recommendations are made to the Member State

concerned. In particular, concerning the atmospheric compartment this may relate to the siting of gamma dose rate monitors (height above ground, maintenance, nearby obstructions etc.). A common problem encountered with airborne particulate monitoring equipment is the calibration of the flow rate, or subsequently in the laboratory where calibration and maintenance of the detector causes concern. Best practices are also identified when encountered and have proved useful in assisting other Member States where a problem is identified.

The methods and equipment used in the Member States for environment and discharge monitoring are highly variable due to different approaches, budgetary limitations but also to the lack of technical guidance issued at EU level.

In order to tackle this problem, unit ENER D.3 has taken the initiative to propose guidelines on monitoring methodology in the form of a technical guidance document on the implementation of the Euratom Treaty Article 35 in the EU Member States. Its purpose is to map the current practices of environmental and discharge radioactivity monitoring in the EU and to present them in a single document, which could assist the EU Member States in reviewing and developing their monitoring programmes. The document is divided in separate parts discussing environmental monitoring and discharge monitoring. There are also separate technical annexes on both topics.

This work was initiated

- to provide an improved technical methodology for the Commission verification programme under Art. 35 and
- to provide technical harmonisation guidance for the Member States.

Specific elements of the draft document were discussed with the Member States at the Art. 35/36 meeting in April 2016 and ENER D.3 has received informal comments from some Member States.