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TREN.H.4 – Radiation Protection

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

Irish National Monitoring Network for Environmental Radioactivity

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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 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 different locations for monitoring environmental radioactivity in Ireland, from 01 to 04 May 2007. 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:

- The structure of the national environmental monitoring and sampling programme;
- The analytical laboratory of the Radiological Protection Institute of Ireland;
- On-line automatic monitoring systems;
- Environmental monitoring programmes in south-eastern Ireland;
- Monitoring in hospitals.

The team carried out verifications of monitoring systems and sampling facilities in different locations of Ireland. 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 Irish competent authority.

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 Cahore, Rosslare, Kilmeaden and Kilkenny sampling points

The verification activities performed at the Cahore sampling point:

1.1. Established that sampling of four canisters of 25 litres each of seawater and of 2 to 3 kg of algae is performed twice a year at this site.

The verification activities performed at the Rosslare sampling point:

1.2. Confirmed that a local station and the data logger of the automatic dose rate monitoring system are located at the premises of the Irish National Meteorological Service (MET Éireann).

Established that the equipments for dose rate monitoring, air sampling and precipitation sampling are fully installed and functional.

The verification activities performed at the Kilmeaden sampling point:

1.3. Established that the equipment for dose rate monitoring is installed and functional.

The verification activities performed at the Kilkenny sampling point:

1.4. Established that the equipments for dose rate monitoring and precipitation sampling are installed and functional.

Verification does not give rise to recommendations.

2 Main findings with respect to the Cork University Hospital

The verification activities performed concerning "radioactive discharges" from the Cork University Hospital:

2.1. Established that the liquid radiobiological wastes from the radio-iodine suite are piped into a holding/delay tank with a capacity of 1000 litres and that the fluids are stored as long as possible for decay. The activity discharged is calculated based on the full administered amounts of radioactivity (i.e. worst case scenario). After the decay period (calculated) the tank content is discharged into the sewage system without measurement.

2.2. Established that some patients, despite the information and warnings received from the hospital personnel flushed a wide variety of detritus into the toilet. On one occasion in 2005 blocked sewage pipes led to the radio-iodine suite being removed from service because of a leak from the sewage system which contaminated an area of ground outside the suite. This leak required a major modification to the liquid waste system to reduce significantly the risk of a recurrence. In case of a blockage in the sewage pipe leading to the holding tank, there is now a separate direct overflow into the general sewage system. A revised risk assessment was carried out and new quality control measures and procedures were implemented which have prevented further contamination incidents.

However,

2.3. With respect to the point 2.1 above, the Irish regulator informed the team that, currently there is no legal requirement for storage tanks; however, Ireland committed itself to follow OSPAR requirements and thus may change the regulations accordingly if necessary.

In order to validate the models used and to cross check the initial activity calculations and dose estimations, the verification team recommends periodically taking and analysing appropriate discharge samples. In addition, if a further reduction of the activity discharged is envisaged the installation of a decay system with separate tanks that can be used in alternation should be considered.

The verification activities performed concerning the "radio-pharmacy laboratory" at the Cork University Hospital:

2.4. Established the availability of a Berthold LB3210 B and an FHT 111M contamination monitor that are used for performing regular checks.

2.5. Established the presence of two toilets dedicated to patients treated at the nuclear medical department. The WCs are monitored twice a day with portable gamma monitors. The same checking procedure applies for all the rooms of the radio-pharmacy laboratory. Spreadsheets containing information on contamination measurements of the rooms, and on activities distributed to the patients are available in the laboratory.

Verification does not give rise to recommendations.

3 Main findings with respect to St James's Hospital

The verification activities performed at the Radioiodine suite (Radionuclide Therapy Department) at St. James's hospital:

3.1. Confirmed that the suite is quite comfortable and equipped up to current standards; it noted that the room looks into the green with a large window is letting in light. Dose rate records are written daily into a logbook. Radiation safety procedures for staff are available at all workplaces around the suite. A wash–hand basin is also situated in the entrance lobby. Food and drinks enter and leave the suite via a shielded access hatch,

the patient being previously announced by phone. Food wastes are disposed in a waste disposal.

3.2. Established the presence of regulations claiming that before hospitalisation, the patient is required to bring old clothes which must be abandoned as waste at the end of the period of staying in the suite. Private visits are restricted: no visitors for the first 24 hours. Visits should not be longer than 30 minutes and the visitor should stay at a minimum of 3 m distance from the patient. No children or pregnant women are allowed to enter the suite. The contact with nursing or clinical staff is limited to the necessary.

3.3. Established that St. James's does not operate a discharge tank; liquid radioactive discharges go directly to the main sewage pipe. The sewage purification plant taking up the discharges is operating automatically. Model calculations performed have shown that the dose to workers in the sewage purification plant due to discharges is acceptable.

However,

3.4. With respect to the point 3.3 above, the Irish regulator informed the team that, currently there is no legal requirement for storage tanks; however, Ireland committed itself to follow OSPAR requirements and thus may change the regulations accordingly if necessary.

In order to validate the models used and to cross check the initial activity calculations and dose estimations, the verification team recommends periodically taking and analysing appropriate discharge samples. In particular, with regard to potential doses to workers in the sewage purification plant, the use of a highly conservative approach for modelling such exposures is recommended. In addition, if a further reduction of the activity discharged is envisaged the installation of a decay system with separate tanks that can be used in alternation should be considered.

The verification activities performed at the Radio-pharmacy laboratory (Radionuclide Therapy Department) with regards to the radioactive waste storage room situated outside main building at St. James's hospital:

3.5. Established that radioactive wastes are segregated according to their half-life. St. James's hospital stores such wastes in a dedicated room outside of the laboratory. It is accessible via a backyard on the Campus. Radioactive wastes are stored in plastic bags, 'sharpak' containers and other special recipients, until the radiation level decays 'to background'. These recipients are labelled with the radioisotope name, the date they were brought in and the foreseen end of storage. Results of radiation monitoring are noted at regular intervals on a list available in the storage room.

However,

3.6. With respect to the point 3.5 above, the Irish regulator informed the team that Ireland does not operate a radioactive waste repository. Thus, e.g. a legacy of very old technetium generator cores (the lead having been stripped) with residual Tc-99

activity exists. Storage of such wastes currently is somehow unclear. In some cases wastes can be sent to other countries for disposal. St. James's hospital stores such wastes in a dedicated room outside of the laboratory. It is accessible via a backyard on the Campus.

Verification does not give rise to particular remarks concerning radioactive waste handling. However, it would endorse Ireland finding a country-wide solution for the radioactive waste storage issue.

4 Main findings with respect to RPII - Analytical Laboratory

The verification activities performed at the RPII - Analytical Laboratory:

4.1. Established that sample registration, preparation and measurements are well performed and that the laboratory is well equipped. The installation of a new laboratory information management system is foreseen.

However,

4.2. With respect to the point 4.1 above, the team was informed that the connection to the new laboratory information system was successfully tested for gamma spectroscopy.

Verification does not give rise to recommendations. The team strongly supports the full implementation of the new laboratory information management system; more specifically, the verification team encourages connecting all measurement systems to the laboratory information management system to avoid as far as possible manual input errors.

The verification activities performed at the High Volume Air Sampler of RPII - Analytical Laboratory:

4.3. Established that an indirect method of air flow determination is used by the laboratory.

However,

4.4. Since the flow rate for such high values (at the time of construction) could not be measured directly, a special by-pass type system was installed inside the air sampler leading the air stream to six small filters.

The verification does not give rise to recommendations However, the verification team suggests investigating if the assumption underlying the check of the used air flow 'calibration' method – i.e. that the Be-7 relevant particle size distribution is the same for the main air stream and the bypass – is correct.

CONCLUSIONS

All verifications that had been planned by the verification team were completed successfully. In this regard, the information supplied in advance of the visit, as well as the additional documentation received before the start and during the verification, was useful. 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 Ireland are in place and functional. The Commission could verify the operation and efficiency of most of a selected number of these facilities.

(2) A few topical recommendations are formulated. These recommendations aim at improving some aspects of environmental surveillance in Ireland. The recommendations do not discredit the fact that environmental monitoring in Ireland is in conformity with the provisions laid down under Article 35 of the Euratom Treaty.

(3) In order to validate the models used and to cross check the initial activity calculations and dose estimation concerning the discharge of radioactive liquids from hospitals, the periodically taking and analysing of appropriate discharge samples is recommended. In addition, if a further reduction of the activity discharged is envisaged the installation of a decay system with separate tanks that can be used in alternation should be considered.

(4) The Commission Services ask the Irish competent authority to inform them of any progress with regard the recommendations made.

(5) The verification team acknowledges the excellent co-operation it received from all persons involved.

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C. GITZINGER
signed
Team Leader