Radiological Protection Institute of Ireland

EXECUTIVE SUMMARY 2010

Radiological Protection Institute of Ireland
An Institiúid Éireannach um Chosaint Raideolaíoch

Executive Summary

2010 marked the end of the 2008-2010 strategic planning period for RPII. Overall, RPII was very successful in achieving its goals, despite the challenging situation with regard to staffing. The key achievements and activities in each of the main areas of work of the RPII during 2010 are set out below.

Radon

The RPII's strategic objective on radon is to work to increase awareness among all key stakeholders of the RPII's advice on radon with the ultimate aim of the adoption and implementation of a national radon control strategy by Government. To this end, in April 2010, the RPII and Health Service Executive published a joint position statement on radon which recognises radon as an important public health hazard requiring a coordinated national response. The statement recommended the immediate establishment of an appropriately constituted National Expert Group to develop a National Radon Control Strategy for Ireland. Following publication of the statement, RPII worked with DEHLG to complete the preparatory work for the establishment of the National Expert Group.

In January 2010, RTÉ's Prime Time programme broadcast a special feature on radon which gave rise to increased awareness of the issue. To capitalise on the heightened level of awareness, RPII ran integrated local information campaigns in the following months in Sligo (March), Carlow (April) and Waterford (October); all counties previously identified as having high radon levels. The campaigns included distribution of awareness literature to every household in the county, advertising on local radio and in newspapers, as well as interviews, promotional activities, developing web and Facebook pages, public meetings and tailored briefing sessions for local public representatives and business/industry groups. The local campaigns were very successful and resulted in a substantial increase in the number of radon measurements undertaken by householders in each county.

The National Radon Forum is a key focal point for the RPII's radon programme each year. In 2010, the Forum was held in Cork with the theme "Radon a well known health risk – how do we influence the public to take action?".

The Forum was one of the largest to date with 75 people attending from local authorities, the HSE, HSA, DEHLG, State Claims Agency, radon measurement companies, radon remediation contractors and universities.

Employer information and education remained the primary focus of the RPII's radon in workplaces programmes in 2010. RPII inspectors included radon awareness in 146 of their inspections carried out during the year, while Health and Safety Authority inspectors addressed radon in 440 inspections of enclosed ground level workplaces in high radon areas. RPII inspectors also visited 6 underground workplaces during the year where occupational exposure to radon has to be managed on an ongoing basis.

By the end of the year, RPII's radon database included measurements for almost 43,000 homes. Of these, 5080 have radon concentrations above 200 Bq/m^3 with 575 having levels above 800 Bq/m^3. During the year, 9 homes with radon levels of more than 10 times the Reference Level were identified, reinforcing the RPII's message that Ireland has a serious radon problem requiring a coordinated Government led response.

Regulation and licensing

At the end of 2010, 1737 licences were in force across a range of sectors including medical, industrial, educational, dental and veterinary. Sixty five new licences were issued during the year including 33 in the dental sector. Fifty six licences were closed leading to a small increase overall when compared with 2009. The most notable licence application received during the year was for the new National Cancer Control Programme radiotherapy centres at St James's and Beaumont Hospitals in Dublin, each of which when completed will have four linear accelerators. Two of the four linear accelerators at St James's Hospital were licensed for use at the start of 2011.

Two hundred and thirty five inspections were carried out during the year. Particular areas of focus included distributors of ionisation chamber smoke detectors, security of radioactive sources, dental licensees and non-destructive testing companies. The inspections also focused on the enforcement of the Radiation Protection Advisor (RPA) requirement in the industrial sector and on raising radon awareness across all sectors. In the dental sector, the standard of radiation protection in the practices inspected was high, with significant improvement in licensing matters following the introduction of the requirement to appoint an RPA. Security audits of two large hospitals and one industrial facility were undertaken in conjunction with the National Crime Prevention Unit of An Garda Síochána. In general, inspectors continued to observe good standards of radiation protection across all sectors, with particular improvements noted in the industrial and educational sectors following the introduction of the requirement for these licensees to appoint an RPA.

Each year, the RPII undertakes a renewal programme for licenses that are due to expire within the year. During the 2010 renewal programme, the RPII's solicitor had to write to 27 licensees who failed to contact the RPII following correspondence reminding them to renew expired licenses. All but one licensee undertook the necessary action to ensure that they were compliant with their regulatory requirements. Dr Raymond Herring, Back and Neck Clinic, Castlebar, Co Mayo, failed to renew his licence in July 2009. Following an inspection in July 2010, Dr Herring was prosecuted and convicted in the Castlebar District Court in January 2011. He was fined €350 and ordered to pay €500 towards the RPII's legal costs.

In line with new guidelines on incident reporting published in 2009, RPII was notified of 12 incidents in the medical and dental sectors. The majority of incidents concerned individuals undergoing radiological procedures where hospital staff incorrectly examined the wrong patient. In all cases the incidents were fully investigated to the satisfaction of the RPII and measures put in place by the hospitals concerned to prevent recurrences.

The RPII has been consistent over many years in calling for the development of a Government policy to deal with radioactive waste management in Ireland. In December 2010, the interdepartmental group established in 2008 to assess the issues made its first report to Government. The Government agreed to the main recommendations of the Group including the implementation of a phased inventory reduction programme to decrease the number of disused radioactive sources currently stored in Ireland; the establishment of a National Interim Storage Facility for such sources; and the implementation as a matter of urgency of arrangements for the short-term emergency storage of orphan (no identifiable owner) or seized radioactive sources. An implementation Committee and working groups have been established to take this work forward.

Engagement with relevant stakeholders is an essential aspect of promoting and achieving higher standards of radiation protection, particularly in the regulatory environment. During 2010, the RPII engaged with Health Service Executive, Dental Council, Medical Council, Veterinary Council of Ireland, Health and Safety Authority, Department of Education and Science, Department of Transport, An Garda Síochána, Customs, Environmental Protection Agency, City and County Managers Association, Fire Engineering Systems Association, Department of Enterprise, Trade and Innovation (Import and Export Controls), Irish lamps industry and Irish Aviation Authority to discuss areas of mutual interest and to identify joint tasks aimed at generating efficiencies and avoiding duplication of effort.

The RPII's Dosimetry Service provides a personal monitoring service to determine occupational exposure to ionising radiation. In 2010, 127 or 1.5% of the individuals monitored had annual doses exceeding the minimum reporting level of 0.1 mSv. Twenty workers had annual doses exceeding the dose limit for members of the public of 1 mSv, but none exceeded the annual dose limit for workers of 20 mSv.

As is required by law, the exposure of aircrew to ionising radiation must be monitored to determine if measures to control exposure are required. During 2010, information received from 7 licensed air operators showed that 11,077 individuals were estimated to receive annual radiation doses above 1 mSv, with 113 of these in excess of 4 mSv and none over 6 mSv. Since monitoring of aircrew began in 2003 there has been a consistent yearly increase in the number of aircrew receiving doses in excess of 1 mSv, but doses have been maintained below 6 mSv.

Exposure of the Irish population to radiation

The RPII continued its programme of monitoring radiation in the environment during the year with the aim of assessing the exposure of the population. The 2010 programme showed that liquid discharges from the nuclear fuel reprocessing plant at Sellafield remain the dominant source of artificial radioactivity in the Irish Sea and that the consumption of seafood continues to be the main way in which the public is exposed to this radiation source. The radiation doses to typical consumers of seafood were well below 1 microsievert (μSv), and may be compared with the average annual dose to a person in Ireland from all sources of radioactivity of 3950 μSv.

Levels of ambient gamma dose rate and radioactivity in air measured at 14 and 12 stations around the country, respectively, showed no abnormal readings and were consistent with measurements in previous years. The levels of radioactivity in milk, drinking water and mixed diet were also low and consistent with levels measured in previous years. These measurements provide confirmation that the levels of artificial radioactivity in the environment do not constitute a risk to health and are very small when compared with the dose received as a result of natural background radiation.

The study of radioactivity in groundwater supplies, commenced in conjunction with the EPA in 2008, continued during the year. By the end of 2010, samples from all 220 locations in the study had been collected and analysed for their radioactivity content. All the samples were found to comply with the EC Drinking Water Directive with regard to radioactivity content.

A study of tritium levels in seawater started in 2008 to fulfil Ireland's commitments to the OSPAR Convention for the protection of the marine environment of the NE Atlantic was completed during 2010. Tritium has a low radio-toxicity and as such is not included in RPII's routine monitoring programme. However, it is discharged from nuclear power stations and the aim of the study was to establish a baseline against which future discharges might be measured as nuclear power production increases in Europe. The majority of the 67 samples included in the study had tritium concentrations below the limit of detection, with the highest value of 2.4 Bq/l being measured in Balbriggan.

During 2009, a comprehensive review of the RPII's monitoring programme was undertaken by a specially constituted group of five independent experts to ensure that the programme meets its stated aims and to make recommendations for improvement, if required. The review panel broadly endorsed the RPII's monitoring programme and made some specific recommendations concerning sampling and skills maintenance for consideration in future programmes. In early 2010, the RPII conducted a number of internal workshops to address the recommendations and based on this a revised monitoring programme for 2011 has been developed.

Radiation Measurement Services

In total, the RPII measured the radioactivity content in 1932 environmental samples and foodstuffs during the year. Certificates specifying the radioactivity content issued to exporters of Irish produce numbered 3211, almost identical to the previous year, indicating an ongoing and steady demand for this service. The RPII's Dosimetry Service supplied approximately 74,000 dosimeters to clients during the year. These dosimeters were used to monitor the

radiation exposure of over 8000 individuals. The Calibration Service tested 443 instruments for compliance with the relevant manufacturers' specifications. Radon measurements were completed in 5371 homes and 393 workplaces, of which 47 were schools. As a result of the Prime Time programme and RPII's targeted local radon awareness initiatives, the number of measurements in homes greatly exceeded the 2550 measurements undertaken in 2009.

During the year, RPII maintained accreditation to the ISO 17025 standard for its key measurement services. It continued to increase the use of web and other electronic interfaces to improve service delivery for customers, while at the same time increasing process efficiency within the laboratory.

Emergency preparedness

During 2010, the RPII undertook a number of initiatives to enhance its capacity to respond to a nuclear accident abroad as part of the National Emergency Plan for Nuclear Accidents (NEPNA). A two-day joint workshop for staff from RPII and Met Éireann was organised to improve the way in which simulation of different weather conditions and weather forecast data is integrated into RPII's decision support system, ARGOS. The National Radiation Monitoring Network was upgraded with the installation of a new site at Coolgreany in Wexford and the closure of older sites in Kilkenny and Mullingar.

The annual programme of emergency exercises organised by RPII was supplemented by participation in 7 international emergency exercises organised by the International Atomic Energy Agency and the European Commission. These exercises are invaluable in highlighting any technical issues and gaps in Ireland's response needing rectification. RPII is represented on and participates actively in international groups related to nuclear and emergency preparedness to ensure that Ireland's response is in line with best practice and conforms to international guidelines.

Safety of nuclear facilities abroad

The RPII continued to closely monitor developments at Sellafield and other UK nuclear sites. At Sellafield, technical problems and planned outages in both the Highly Active Liquor and Evaporation Storage (HALES) facility and the waste vitrification plant resulted in lower than anticipated vitrification throughput, which taken together with other factors, resulted in a marginal increase in the volume of highly radioactive liquid stored on site by the end of the year. The levels remain, however, well below the limit specified by the UK regulators. In July, RPII staff were briefed by the Sellafield operating company on the Sellafield Lifetime Plan which sets out the work to be performed on the site over its lifetime to 2120. RPII noted that UK regulators are not satisfied with many of the dates included in the plan and that they are pushing for better performance. In July also, RPII staff were briefed by UK regulators on the likely extension to the operating lifetime of the Wylfa Nuclear Power Station in Wales for up to two years (i.e. December 2012) – the extension was subsequently confirmed in October 2010.

Also in 2010, the UK government announced plans to develop new nuclear power stations on up to 8 sites in England and Wales, five of which are on the Irish Sea Coast. The plans aim to see construction begin in 2012 with the first plants operational before 2025. RPII provided technical support to DECLG in their responses to consultations on these plans.

During the year, a number of incidents at Sellafield and other UK nuclear sites were brought to RPII's attention by UK regulators. All events were rated as Level 1 or lower on the seven-point International Nuclear Event Scale (INES) and there was no radiological impact on Ireland from any of the events. RPII was also notified of a number of INES rated Level 2 events in other European countries but again, none of the incidents had offsite consequences and, therefore, had no radiological impact on Ireland.

The most significant event during the year was the discovery of cobalt-60 pieces at a scrap metal dealer's premises in New Delhi, India. The incident was discovered

following seven patients presenting at a hospital with symptoms suspected to be caused by radiation exposure. It was subsequently rated Level 4 on the INES scale and was noted by the IAEA as the worst radiation incident in four years.

At the international level, RPII's efforts were directed towards participation in the European Nuclear Safety Regulators Group (ENSREG) and in particular, contributing to the development of the Euratom Nuclear Safety Directive and a directive on radioactive waste and spent fuel. RPII staff also provided support to DEHLG to review and update Ireland's National Plan for the implementation of the Radioactive Substances Strategy under the OSPAR Convention for the Protection of the Marine Environment of the North East Atlantic and to prepare for the Review Meeting of the IAEA Convention on Nuclear Safety due to be held in 2011.

Corporate Services

The Corporate Services Division supports all aspects of the RPII's work and aims to ensure that conditions are created that promote efficiency and effectiveness and a positive organisational culture, as well as strong governance and compliance.

2010 was a busy year in terms of communications activities. The coverage of radon in the Prime Time programme early in the year, followed by the local radon awareness campaigns in Sligo, Carlow and Waterford generated substantial media interest. The focus on radon was also reflected in an increase in visitor numbers to the RPII website.

Market research to help understand the needs and concerns of RPII stakeholders found that awareness of RPII is relatively low, while awareness of radon is quite high at 77%. Fifty six per cent of people perceive radon in the home to be a risk to health but among those aware of radon, 61% were unlikely to have their homes tested, highlighting the real challenge of turning awareness into action. The research also included qualitative aspects which will inform future awareness campaigns and communications in general.

Continuing to deliver the RPII's statutory functions against a background of decreasing staff numbers remains challenging. Efficiencies and improved customer service were realised where possible through the use of technology. In particular, the Performance Management and Development System was updated and computerised, the groundwork was laid for the server configuration to be migrated to the new virtualisation technology and video conferencing was introduced. These and other actions are included in the RPII Action Plan under the Public Service Agreement which is available on our website.

All aspects of its governance remained a priority for the RPII during 2010. The major developments included the enhancement of the internal audit function, the establishment of a high-level expert advisory body to advise the Board on all matters to do with ionising radiation and the re-constitution of the Communications Advisory Committee.