



## Radiological Protection Institute of Ireland Annual Report and Accounts 2009



**Radiological Protection Institute of Ireland**  
An Institiúid Éireannach um Chosaint Raideolaíoch

To the Minister for the Environment,  
Heritage and Local Government

In accordance with the requirements of the Radiological  
Protection Act, 1991, I have the honour to present the Annual  
Report and Statement of Accounts of the Radiological Protection  
Institute of Ireland for the year ended 31st December 2009.



**Prof Eugene Kennedy**  
Chairman

## Mission Statement

*"In the three year period from 2008 to 2010 the RPII will grow the level of awareness and implementation of the measures needed to protect people in Ireland from the harmful effects of ionising (and non-ionising) radiation through scientifically based regulation, monitoring and advice."*

## Dose Limits and Reference Levels

The dose limit for a member of the public is 1 mSv in any 12 month period

The dose limit for radiation workers is 20 mSv in any 12 month period  
Additional limits apply to exposure to specific parts of the body

The Reference Level for radon in homes is 200 Bq/m<sup>3</sup>

The Reference Level for radon in workplaces is 400 Bq/m<sup>3</sup>

The Reference Level for radon in schools is 200 Bq/m<sup>3</sup>

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*\*This report is available in Irish at [www.rpii.ie](http://www.rpii.ie)*

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# Abbreviation List

<b>ALMERA</b>	Analytical Laboratories for the Measurement of Environmental Radioactivity	<b>ICT</b>	Information Communications Technology
<b>AWIG</b>	Analysts Informal Working Group	<b>INAB</b>	Irish National Accreditation Board
<b>BAT</b>	Best Available Techniques	<b>INES</b>	International Nuclear Event Scale
<b>Bq/l</b>	becquerels per litre	<b>IRAC</b>	Ionising Radiation Advisory Committee
<b>Bq/m<sup>3</sup></b>	becquerels per cubic metre	<b>IRMF</b>	Ionising Radiation Metrology Forum
<b>CSN</b>	Consejo de Seguridad Nuclear	<b>IRRS</b>	Integrated Regulatory Review Service
<b>DAFF</b>	Department of Agriculture, Fisheries and Forestry	<b>mSv</b>	millisievert
<b>DCENR</b>	Department of Communications, Energy and Natural Resources	<b>MoU</b>	Memorandum of Understanding
<b>DCU</b>	Dublin City University	<b>NEA</b>	Nuclear Energy Agency
<b>DECC</b>	Department of Energy and Climate Change	<b>NEPNA</b>	National Emergency Plan for Nuclear Accidents
<b>DEHLG</b>	Department of the Environment, Heritage and Local Government	<b>NEWS</b>	Nuclear Events Web Based System
<b>EGIR</b>	Expert Group on Ionising Radiation	<b>NORM</b>	Naturally Occurring Radioactive Materials
<b>ENSREG</b>	European Nuclear Safety Regulators Group	<b>NPP</b>	Nuclear Power Plant
<b>EPA</b>	Environmental Protection Agency	<b>NRPA</b>	Norwegian Radiation Protection Authority
<b>EPR</b>	European Pressurised Reactor	<b>OSPAR</b>	Oslo-Paris Convention
<b>ERPAN</b>	European Radiation Protection Authorities Network	<b>PMDS</b>	Performance Management and Development System
<b>EURADOS</b>	European External Dosimetry Group	<b>PRMG</b>	Personal Radiation Monitoring Group
<b>EURNMET</b>	European Metrology Group	<b>QCS</b>	Quality Customer Services
<b>FSAI</b>	Food Safety Authority of Ireland	<b>RASSC</b>	Radiation Safety Standards Committee
<b>GDA</b>	Generic Design Assessment	<b>RPA</b>	Radiation Protection Adviser
<b>HALES</b>	Highly Active Liquor Evaporation and Storage	<b>RPII</b>	Radiological Protection Institute of Ireland
<b>HASS</b>	High Activity Sealed Sources	<b>SI</b>	Statutory Instrument
<b>HASTS</b>	Highly Active Storage Tanks	<b>UCD</b>	University College Dublin
<b>HLG</b>	High Level Group	<b>UK-DECC</b>	UK Department of Energy and Climate Change
<b>HSA</b>	Health and Safety Authority	<b>UK-EA</b>	UK Environment Agency
<b>HSE</b>	Health Service Executive	<b>UK-HPA</b>	UK Health Protection Agency
<b>IAEA</b>	International Atomic Energy Agency	<b>UK-HSE-ND</b>	UK Health and Safety Executive-Nuclear Directorate
<b>ICRP</b>	International Commission on Radiological Protection	<b>UK-NPL</b>	UK National Physical Laboratory
<b>ICSD</b>	Ionisation chamber smoke detectors	<b>UK-NDA</b>	UK Nuclear Decommissioning Authority
		<b>WHO</b>	World Health Organisation

# Functions of the RPII

The Institute's principal objectives are:

- To provide advice to the Government, the Minister for the Environment, Heritage and Local Government and other Ministers on matters relating to radiological safety.
- To provide information to the public on matters relating to radiological safety.
- To maintain and develop a national laboratory for the measurement of levels of radioactivity in foodstuffs and the environment, and to assess the significance of these levels for the Irish population.
- To provide a personnel dosimetry and instrument calibration service for those who work with ionising radiation.
- To control by licence the custody, use, manufacture, importation, transportation, distribution, exportation and disposal of radioactive substances, irradiating apparatus and other sources of ionising radiation.
- To assist in the development of national plans for emergencies arising from nuclear accidents and to act in support of such plans.
- To monitor developments abroad relating to nuclear installations and radiological safety in general; and to keep the Government informed of their implications for Ireland.





# Strategic Priorities for the RPII

The RPII has developed a clear strategy to strengthen radiation protection in Ireland over the three year period, 2008-2010. This is set out in full in the document RPII **Strategic Plan 2008-2010**.

The RPII has set a number of goals by which its success in the period 2008-2010 can be measured:

- Information about radiation protection must be readily available, accessible and understandable to a non-scientific audience, so that the public is confident of its ability to be protected from its harmful effects.
- The information provided by the RPII must be scientifically based and accurate at all times. It will seek to sustain its position as a trusted source of information to public and professional audiences in Ireland on this area.
- The national regulatory infrastructure for practices and work activities involving ionising radiation must be complete and must function effectively. Identified gaps in the infrastructure, such as a national policy on radioactive waste disposal, must be successfully resolved.
- A national strategy for addressing high radon levels in homes must be developed and implemented. This strategy needs to target, in particular, those who have not participated in previous studies and the many new homes built in the last decade.

- Following the Government decision to give responsibility for non-ionising radiation to the RPII (including the allocation of resources), these new work streams must be successfully integrated into the work of the RPII.
- The RPII will continue to provide high-quality scientifically based advice on radiation protection issues as an input to Government policy. A targeted research programme will support this advisory role.

Impact will be measured by:

- User compliance with regulatory requirements.
- Effective cooperation with relevant regulatory bodies and partners with a role in radiation protection.
- Enhancement of the RPII's profile with key decision makers.
- Ease of access for the public and Government to high-quality information and monitoring data on all radiation protection issues of concern.
- A better understanding by the public of radiation protection issues.



## Chairman's Statement



I am pleased to introduce the Annual Report and Accounts of the Radiological Protection Institute of Ireland for 2009. The year was challenging, particularly as regards the maintenance of key skills and human resource capacity against the background of the moratorium on recruitment and promotion. Nonetheless, the RPII sought to maintain focus on the achievement of its key objectives.

The two most pressing radiation protection issues identified in the RPII's strategic plan for the period 2008-2010 are the development by Government of a National Radioactive Waste Management Policy and a National Radon Strategy.

As has been the situation in Ireland for many years, unwanted radioactive sources are held under licence at 80 different locations around the country. The RPII's advice to Government over many years is that these arrangements are not in keeping with international best practice promulgated by the International Atomic Energy Agency and they represent an increasingly serious concern from the point of view of safety and security. While fortunately not resulting in harm to individuals, the investigation of incidents reported in this year's Annual Report concerning a missing lightning preventor and the unauthorised shipment of a consignment of smoke detectors to Norway for disposal, did demand significant resource from the licensees involved and the RPII. These are the types of incidents that could be avoided were a national facility for the storage of disused radioactive sources available in Ireland. During 2009, the interdepartmental High Level Group established by the Department of the Environment, Heritage and Local Government (DEHLG) continued to meet to consider the elements needed to formulate a national radioactive waste management policy. The work of the Group lost some momentum, but I understand that the interim report setting out progress and detailing options for consideration is now due to be

brought to Government in the autumn of this year. The RPII will continue to participate actively in the High Level Group and to press for the successful resolution of this long-standing issue.

During 2009, further homes with elevated levels of the cancer-causing gas radon were identified with eight homes having levels in excess of 2000 Bq/m<sup>3</sup> identified in six counties. By the end of the year, 4921 homes with radon levels in excess of the national Reference Level had been identified by the RPII, representing 13% of the total number measured. In terms of health detriment, exposure to radon is implicated in up to 200 of the 1500 lung cancers registered in Ireland each year. Further progress towards the development of a National Radon Control Strategy for Ireland was made through joint working with the Health Service Executive, the Department of the Environment, Heritage and Local Government, the Health and Safety Authority and Local Authorities. There is an urgent need to bring each of these strands of activity together in a unified, Government-led national strategy to ensure that Irish citizens are adequately protected from the harmful effects of radon gas.

The adoption during 2009 of a Directive establishing a Community framework for the safety of nuclear installations by the European Council was a very positive development from an Irish perspective. The aims of the Directive, which is due to be implemented by Member States by July 2011, are to maintain and promote the continuous improvement of nuclear safety and its regulation with particular emphasis on the protection of the general public and workers. Through its participation in the European Nuclear Safety Regulators Group which advises the Commission on implementation measures, RPII has an opportunity to provide a voice for Irish concerns and to influence the measures adopted. Closer to home, the RPII continues to actively monitor developments at Sellafield and other UK nuclear sites. The resources required for this work are likely to increase in the coming years with the development of plans in the UK to build new nuclear power plants to replace those that are scheduled to close over the next 20 years.

The Board continued to develop its corporate governance framework during the year in line with the revised Code of Practice for the Governance of State Bodies. The RPII Corporate Governance Manual first adopted in 2007 was updated and training for newly appointed Board and Audit Committee members was undertaken. In light of the deteriorating financial situation across the public service, the Board established a subcommittee to review the RPII role in commercial services and the strategic alignment of these activities with overall goals. RPII currently derives approximately 16% of its income from commercial services.



On my own behalf, and on behalf of the Board members, I wish to thank of all the staff of the RPII for their dedication and hard work during the year. In particular I wish to acknowledge the excellent response of staff to the additional workload brought about by the reduction in staff numbers resulting from the moratorium on recruitment implemented across the public service in March. Two senior members of staff, Mr Christopher Hone and Dr Tony Colgan left the RPII during the year and I thank them for their contribution to RPII over many years.

I wish to record also my own thanks and that of the RPII to Mr Frank Turvey who retired from the Board in August after 8 years dedicated service. I welcome the re-appointment of Mr Patrick Gilligan, Ms Darina Muckian and Ms Adi Roche to the Board in November 2009 and the appointment of a new member, Mr John O'Dea. I wish to express my sincere thanks to the members of the Advisory Committees on Environmental Radiation and Medical Radiation who gave excellent service to the RPII since its establishment. I welcome the membership of the newly established Ionising Radiation Advisory Committee.

Finally, I wish to record the RPII's appreciation for the support and encouragement received from the Minister for the Environment, Heritage and Local Government, Mr John Gormley, TD and Minister of State, Mr Michael Finneran, TD. The RPII is also indebted to the officials of the Environmental Radiation Policy Section of the Department of the Environment, Heritage and Local Government and other officials in the Department for their wholehearted cooperation at all times. The helpful collaboration of other government departments, third-level educational institutions, agencies and other external organisations with which the RPII has worked during 2009 is also gratefully acknowledged.



**Prof Eugene Kennedy**  
*Chairman*

# Chief Executive's Statement



Good progress was made towards the achievement of the RPII's strategic objectives during the year. However, the moratorium on recruitment and promotion announced early in the year meant that a number of staff with specialist skills who left could not be replaced necessitating the deferral of some projects. On-going review of priorities remains essential.

## Regulation and Licensing

At the end of 2009, 1735 licences were in force across a range of sectors including medical, industrial, educational, dental and veterinary, representing an increase of around 30 on the previous year. Medical licences continue to increase, both in number and in the complexity of the applications. During 2009, a licence was issued for a second ablation suite for the treatment of thyroid cancer using iodine-131 and plans and shielding assessments for eight new linear accelerators at St James's and Beaumont Hospitals were submitted for review.

Two hundred and four inspections were carried out during the year. Particular areas of focus included the use of portable X-ray units for equine radiography, radiotherapy facilities, users of gauges, the non-destructive testing industry, sterilisation facilities and X-ray equipment for security screening purposes. A number of security surveys of licensees' premises were also undertaken with An Garda Síochána. Seven inspections were of dental practices that had failed to renew their licence in September 2008 and three of these enforcement visits resulted in the RPII taking prosecutions through the district Courts against the licensee. In one case the licensee was convicted and fined, while in the other two cases the licensee pleaded guilty; in one case the Probation Act was applied and in the other a charitable donation was ordered.

Investigations of reportable doses undertaken during the year found that five such doses had been received by staff in the medical and industrial radiography sectors. None of the doses exceeded the statutory dose limits. A comprehensive investigation of a missing lightning preventor containing a low activity radium source was unsuccessful in locating the source and a letter of censure was issued to the company involved. The RPII also followed up on a notification from the Norwegian Radiation Protection Authority of the unauthorised delivery of several thousand smoke detectors containing radiation sources to a company in Norway for disposal. The matter was resolved by the return of the smoke detectors to Ireland on the understanding that the company will find an alternative solution for their disposal. Thirteen investigations in the medical sector were carried out on foot of the notification of incidents to RPII. Five of the incidents involved patients and are therefore outside the remit of the RPII. The remainder resulted in the wrong patient receiving the treatment and consequent radiation dose. All were fully investigated and measures have been put in place to prevent recurrences insofar as is reasonably possible.

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 2009, information received from seven licensed air operators showed that 9666 individuals were estimated to receive annual radiation doses above 1 mSv, with 714 of these in excess of 4 mSv and none over 6 mSv.

In general, good standards of radiation protection were observed across all sectors during inspection. Strict adherence to the regulations and licence conditions and care in the management of sources of ionising radiation will ensure that people are not exposed unnecessarily.

A new Code of Practice on the design of diagnostic medical facilities where ionising radiation is used was developed with the Haughton Institute, updating the 1988 Code and providing details of the legislative requirements and practical radiation protection guidance for the main types of radiological and nuclear medicine facilities. Guidance was also issued on the protection of the unborn child during diagnostic medical exposures in collaboration with the Medical Council, the Royal College of Surgeons in Ireland, the Irish Institute of Radiography and Radiation Therapy, the Irish Nuclear Medicine Association and the Association of Physical Scientists in Medicine and on a disposal protocol for decayed disused radioactive sources in conjunction with the Environmental Protection Agency.

Best practice in radiation protection was enhanced through the establishment of a register of Radiation Protection Advisors to provide advice to those working in the industrial and education sectors. The RPII's advice on best practice in relation to the provision of delay and decay holding tanks for iodine ablation treatment facilities was accepted as national policy, i.e. that the fitting of holding tanks in new facilities was advantageous but

that it should be assessed on a case-by-case basis and that the retrofitting of holding tanks to existing facilities was grossly disproportionate to the financial and logistical issues involved.

New legislation on the supervision and control of shipments of radioactive waste and spent fuel was implemented during the year, updating previous requirements and bringing them into line with the most recent EU Directives. There was some progress on the long-standing issue of Ireland's management of its own radioactive waste with the establishment of an inter-departmental High Level Group to advise Government. RPII also participated with the EPA on a project examining the wider issues of the storage of difficult wastes which will underpin the work of the High Level Group.

## 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 2009 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 the most exposed groups (i.e. commercial fishermen and commercial oyster and mussel farmers) were 0.25 and 0.51  $\mu\text{Sv}$ , respectively, while those to typical consumers were 0.1  $\mu\text{Sv}$ . Levels of ambient gamma dose rate and radioactivity in air measured at 15 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, and provide confirmation that the levels of artificial radioactivity in the environment are low and do not constitute a risk to health.

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 considered that the current programme was both adequate and justified. The panel also made some specific recommendations concerning sampling and skills maintenance for consideration in future programmes.

The study of radioactivity in groundwater supplies commenced in conjunction with the EPA in 2008 continued during the year. Samples were collected from 98 locations and analysed for their total alpha and total beta activity levels. In all cases the measured beta activities were below the World Health Organisation screening level while in 16 cases the alpha screening level was exceeded requiring further investigation during 2010.

The study of thoron levels in Ireland undertaken in collaboration with University College Dublin (UCD) and the National Institute of Radiological Sciences in Japan was completed in 2009. The study found that the average dose due to thoron decay products in Ireland was estimated to be 0.38 mSv/year, representing approximately 10% of the total average dose from all sources. The maximum dose estimated was 5 mSv/year, and is equivalent to the dose from the indoor radon concentration at which remediation is recommended.

## Radon

During 2009, addressing the problem of exposure to radon remained a key priority for the RPII. By the end of the year, RPII's radon database contained measurements for over 37,000 homes. Of these 4921 have radon concentrations above 200 Bq/m<sup>3</sup> with 491 having levels above 800 Bq/m<sup>3</sup>. Eight homes with levels well in excess of 2000 Bq/m<sup>3</sup> were identified during the year. There were two homes each in counties Kerry and Sligo with the remaining four in Co. Mayo, Co. Clare, Co. Waterford and Co. Tipperary. Counties Sligo, Waterford and Mayo are already known to be among those counties with the highest percentage of homes above 200 Bq/m<sup>3</sup> with 24%, 22% and 16% respectively, and the number of homes above 800 Bq/m<sup>3</sup> in these counties is 56, 34 and 33. In counties Kerry, Clare and Tipperary, the percentage of homes above 200 Bq/m<sup>3</sup> is slightly lower at 14%, 11% and 11%, respectively, but the number above 800 Bq/m<sup>3</sup> is comparable if not higher at 94, 59 and 14.

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. During 2009, the RPII worked with the Health Service Executive to develop a joint position statement on radon which recognises radon as an important public health hazard requiring a coordinated national response. It also engaged with the Health and Safety Authority to provide information on radon to HSA inspectors to support the inclusion of radon in their inspections. Local authorities are important partners for RPII and, during the year, the RPII published a guide on the implementation of radon measurement programmes in social housing targeted at local authorities. The publication was complemented by an extensive programme to raise awareness of the issues, particularly in counties with high radon levels.

The National Radon Forum is a key focal point for the RPII's radon programme each year. In 2009, the theme was "Towards the development of a radon control strategy for Ireland" and the Forum was opened by Mr Michael Finneran, TD, Minister of State at the Department of the Environment, Heritage and Local Government. Also, during the year, the RPII reviewed how the inclusion of radon disclosure in the conveyancing process could be used to increase the rate at which homes with high radon levels are found. The review highlighted the effectiveness of the measure in other countries and estimated that if similar measures

were introduced in Ireland the time needed to measure the national housing stock could be reduced from 400 years at the current rate of measurement to 40 years. The review also identified the value of a shorter screening measurement technique to support a conveyancing initiative and research on this topic was carried out in cooperation with University College Dublin.

## Radiation Measurement Services

In total the RPII measured the radioactivity content in 1282 environmental samples and foodstuffs during the year. Certificates specifying the radioactivity content issued to exporters of Irish produce numbered 3198, a small decrease on the previous year. The RPII's Dosimetry Service supplied approximately 78,000 dosimeters to clients during the year. These dosimeters were used to monitor the radiation exposure of over 8000 individuals. The Calibration Service tested 419 instruments for compliance with the relevant manufacturers' specifications. Radon measurements were completed in 2550 homes. Of these, 1910 were routine home measurements undertaken at the request of the householder while the remaining 640 were measured as part of research work undertaken by the RPII. During the year, 302 workplaces were measured for radon of which 39 were schools.

## Emergency Preparedness

During the year, the revision of the RPII's sub-plan under the National Emergency Plan for Nuclear Accidents (NEPNA) was finalised and approved for adoption. The technological requirements for the RPII's duty officers were reviewed and a series of recommendations were prepared for implementation in 2010. In addition to its internal emergency exercises in support of its role under NEPNA, the RPII participated in eight international emergency exercises organised by the International Atomic Energy Agency and the European Commission. An important development during the year was the establishment by the Department of Agriculture, Fisheries and Food of an expert group to produce a customised Irish version of the more general "Generic Handbook for Assisting in the Management of Contaminated Food Production systems in Europe following a Radiological Emergency". RPII participated in the expert group providing advice on countermeasures and the handling of contaminated food products.

## Safety of Nuclear Facilities Abroad

An important development during the year was the adoption by the European Council of a Directive establishing a Community framework for the safety of nuclear installations. The Directive aims to maintain and promote the continuous improvement of nuclear safety and its regulation and to ensure that EU Member States provide appropriate national arrangements to protect workers and the general public against the dangers arising from nuclear installations.

The RPII continued to closely monitor developments at Sellafield and other UK nuclear sites. At Sellafield, technical problems with the Highly Active Liquor and Evaporation Storage (HALES) facility resulted in lower than expected throughput, which taken together with other factors, meant that the volume of highly-active liquid radioactive waste remained relatively constant throughout the year. There was a gradual increase in the discharge of the radionuclide antimony-125 to air due to the reprocessing of spent fuel with higher radioactivity content than usual. Operations were suspended to allow an evaluation by the UK Environment Agency (UK-EA) which concluded that the radiological impact on people and the environment of the increased discharge was small compared with the consequences of further delaying the reprocessing of the fuel. RPII modelled the anticipated peak discharges and confirmed that the resulting air concentrations would be of negligible radiological consequence in Ireland.

The RPII continued to track the UK plans to build new nuclear power stations to replace those that are scheduled to close over the next twenty years. The UK process includes a project to evaluate reactor designs which is scheduled to be completed by June 2011 and the identification of potential sites for the deployment of the new designs.

During the year, at the invitation of the UK-EA, RPII participated in an Environment Agency Team inspection of the aqueous waste management arrangements at Sellafield. RPII also participated in a two-day workshop held as part of the UK's Health and Safety Executive Nuclear Directorate (UK-HSE-ND) self assessment of its nuclear regulatory infrastructure. A number of incidents at Sellafield and other UK nuclear sites were advised to the RPII by the UK-EA and the UK-HSE-ND during the year. Two of the events were rated as Level 2 (an incident) on the International Nuclear Event Scale (INES). One of the incidents was the detection of a radioactive leak causing ground contamination in the Magnox facilities at Sellafield. The second occurred at Dungeness B nuclear power plant and demonstrated degradation of the safety in-depth at the site. A third event was the loss of cooling water supplies to the HALES plant. The event was provisionally rated as Level 1 (an anomaly) but final rating is still pending the completion of an investigation by UK-HSE-ND. None of these incidents had offsite consequences and, therefore, had no radiological impact on Ireland.

The RPII was also informed of six other INES Level 2 events in Switzerland, France, Belgium and Hungary. None of the incidents had a radiological impact on Ireland. RPII participated in the Third Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management in Vienna in May. The review process involves the written review by peers of national reports submitted earlier by participating countries. The process culminates in a two week meeting at which each participating country presents a summary of its national report and responds to questions by other participating countries. The aim of the Convention is to maintain



a high level of safety in spent fuel and radioactive waste management. The peer review of Ireland's report noted that Ireland has not yet developed a long-term waste management policy. Also during 2009, RPII assisted the DEHLG in the necessary review and updating of "Ireland's National Plan for the Implementation of the OSPAR Convention" (Oslo-Paris Convention for the Protection of the Marine Environment of the North East Atlantic).

### 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 a strong governance and compliance infrastructure. To this end, a significant development during the year was the launch of the RPII's redeveloped website with many new features including an interactive radon map and radiation dose calculator. Statistics for recording visitor behaviour show that the site compares well with other sites of similar size. A range of communication activities was also undertaken during the year with the aim of improving access to information about radiation protection and monitoring data.

The moratorium on recruitment and promotion impacted negatively with the loss of five staff. Despite this, work continued

on the development of a new performance management system which is due to be implemented in 2010. The RPII's Partnership Committee was active during the year, particularly in support of flu pandemic planning initiatives and the implementation of recommendations from an external audit of internal communications. Improvements in the RPII information technology infrastructure implemented during the year included real time back up for critical servers to improve disaster recovery and the installation of RPII's first virtual server.

I wish to express my personal appreciation to all the staff of the RPII for their continued dedication and professionalism during the year. 2009 was a very difficult year due to the on-going uncertainty about future budgets and staff numbers, and all staff responded very positively to the additional demands made on them. I am also grateful to the staff of the Environmental Radiation Policy Section of the DEHLG and other officials in the Department for their support for the work of the RPII.

**Dr Ann McGarry**  
Chief Executive



# 2009 Highlights

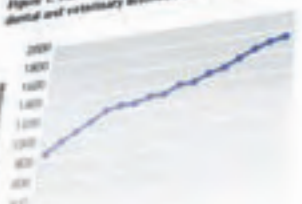
The RPII's Dosimetry Service issued approximately 78,000 dosimeters for over 8,000 individuals in 2009

1,894 samples were tested for radioactivity in 2009

The RPII participated in 8 international emergency exercises during the year

Over 10,000 unique visitors to the RPII website were recorded in October 2009 on the issue of radon in homes

Figure 1: The number of medical, industrial, educational, dental and veterinary licences from 1993-2009



In 2009, an additional 102 new licences were issued bringing the number of licensees to 1,735

In 2009, the committed effective dose to typical seafood consumers was 0.1  $\mu$ Sv

Radon measurements were made in 2,550 homes and 302 workplaces during the year

# Regulation and Licensing

## Introduction

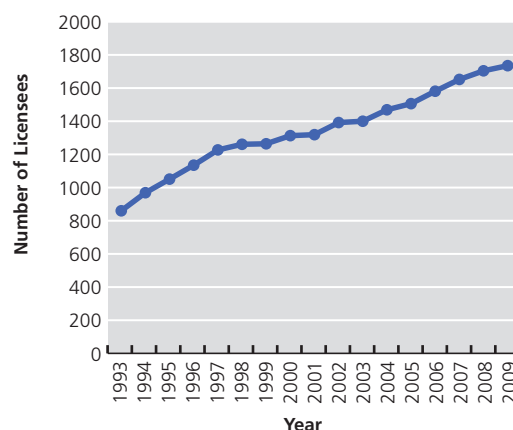
The RPII is responsible for regulating the use of ionising radiation in Ireland and does so through a system of licensing, inspection, guidance and enforcement. Ionising radiation plays an important role in Ireland and is used for diagnostic and therapeutic purposes as well as in research and development, quality control and production processes. The RPII also regulates the exposure of aircrew to cosmic radiation and, where appropriate, work activities involving Naturally Occurring Radioactive Materials (NORM).

## Licensing

The licensing of all users of sources of ionising radiation is one of the core activities of the RPII. The fundamental requirements of the RPII's licensing system are based upon European Directives which are transposed into Irish legislation. These Directives help ensure a consistent approach to the regulation of ionising radiation across Europe. It is through compliance by licensees with the requirements of legislation and the conditions attached to each licence, together with regular inspection by the RPII, that ensures the highest standards of radiation protection are implemented throughout Ireland.

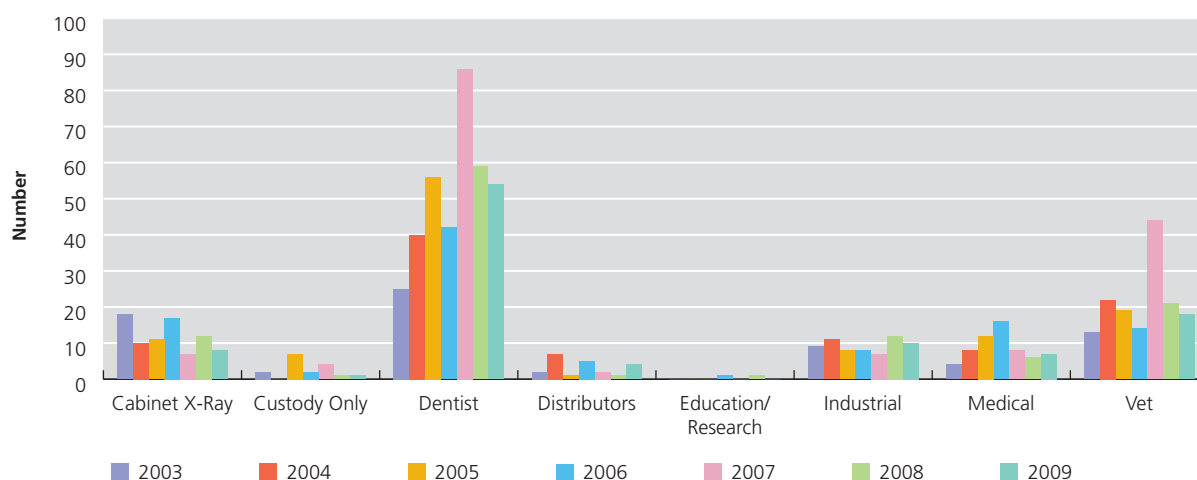
At the end of 2009, licences were held by 1735 licensees across a range of sectors including medical, industrial, educational, dental and veterinary (Figure 1). One hundred and two new licences were issued during the year, with over half (54) of these to licensees in the dental sector (Figure 2). Seventy four licences were closed during 2009 principally in the dental and industrial sectors. The most notable licence application received during the year was for a second iodine ablation suite, for the treatment of thyroid cancer using iodine-131, at a Dublin based hospital. In reviewing the licence application, the RPII took into consideration any potential doses to particular groups, such as sewage treatment plant workers, members of the public, etc., that could arise from the discharge of patient excreta containing iodine-131 to the sewers. The RPII was satisfied that appropriate protection would be afforded all workers and members of the public and, in February, a licence for the expansion of this service was issued to the hospital.

**Figure 1: The number of medical, industrial, educational, dental and veterinary licensees from 1993-2009**



In 2003, the Department of Health and Children's Expert Working Group on Radiation Oncology Services published a report on the development of radiation oncology in Ireland. The report, which became known as the Hollywood Report, proposed the establishment of four national centres of excellence for radiation oncology, two in Dublin and one each in Cork and Galway, supported by two integrated satellite centres at Limerick and Waterford. In August 2009, the Health Service Executive's (HSE) National Cancer Control Programme submitted detailed plans and shielding assessments for Phase I of the project to the RPII which will see the introduction of eight linear accelerators for the Dublin sites, four each at St James's and Beaumont Hospitals. These eight new linear accelerators, along with additional units which will be introduced through Phase II by 2014, will more than double the number of public treatment units that currently exist in Ireland. The review of the shielding assessments for the vaults in which the accelerators will be located must be carried out prior to the issuing of any licence. Once the RPII is satisfied with the proposed plans, a licence can then be issued to the hospital, authorising it to take custody of the accelerators and to commence the commissioning work on the units prior to them being used on patients.

**Figure 2: Categories of new licences since 2003**



## Inspection

One of the core elements of the RPII's regulatory activities is its annual inspection programme. The inspection programme allows the RPII to assess the radiation protection culture and standards that are in place at each location where sources of ionising radiation are held and used. In addition, during these inspections RPII inspectors encourage licensees to further improve radiation protection practices, often by sharing examples of good practice previously observed at similar facilities. The inspection programme is formally reviewed each year and specific areas where further improvements in radiation protection can be made are identified for future action.

The RPII takes a risk-based approach to developing its annual inspection programme, prioritising those licensees involved in higher risk activities such as radiotherapy, non-destructive testing, etc. Account is also taken of the time that has elapsed since individual licensees were last inspected, as well as any incidents that may have occurred. All radiation protection inspections are undertaken in accordance with the scope of the RPII's ISO 17020 accreditation.

During 2009, 204 inspections were carried out where the focus was on radiation protection (Table 1). While inspections are undertaken primarily to assess compliance with both Statutory Instrument (S.I.) No. 125 of 2000 and the conditions attached to each licence, they also provide an opportunity for inspectors to observe examples of good practice which are then brought to the attention of other licensees with similar applications. Particular areas of focus for the programme during the year were the use of portable X-ray units for equine radiography, radiotherapy facilities with the assistance of a UK consultant, users of gauges, the non-destructive testing industry, sterilisation facilities and X-ray

equipment for non-destructive testing or security screening purposes. It is reassuring to note that inspectors continued to observe good standards of radiation protection across all sectors. A number of security surveys were also undertaken with An Garda Síochána of licensees to assess the security arrangements that these licensees have in place.

**Table 1: Inspections undertaken in 2009**

Licence Category	Number in Category	Inspections Undertaken in 2009
Industrial Users	306	84
Industrial Distributors	24	10
Education & Research	21	7
Government Departments and State Run Services	5	1
Hospitals/Medical	171	55
Medical Distributors	27	7
Veterinary Surgeons	268	11
Dentists	913	19
Security Surveys		10
<b>TOTAL</b>	<b>1,735</b>	<b>204</b>

## Developments in Regulatory Practice

In 1988, the Nuclear Energy Board, the predecessor to the RPII, published a Code of Practice on the Design of Diagnostic Medical Facilities Using Ionising Radiation. The Code provided practical advice on radiation shielding issues to persons involved in the

design of new medical facilities and it has proved to be a valuable resource. However, since its publication significant developments have taken place in terms of the underlying radiation protection science, legislation, regulatory practice as well as developments in new medical technologies. Accordingly the RPII undertook to update and revise the Code.

A new **Code of Practice on the Design of Diagnostic Medical Facilities where Ionising Radiation is used** was developed with the Haughton Institute and published during the year. The Code includes a brief review of the current legislative framework and its specific impact on the management of building projects, a presentation of the main types of radiological and nuclear medicine facilities, a treatment of the technical aspects of shielding calculations and a discussion of the practical aspects of implementing shielding solutions in a building context. With the provision of clear up-to-date guidance on good radiation design practice the current high standards of radiation protection, evident through the RPII's inspection programmes, will be maintained into the future.

In the absence of a national waste storage facility to deal with disused radioactive sources, the RPII has developed a new protocol that will go some way to reducing Ireland's stockpile of decayed disused radioactive sources that are currently dispersed across 80 licensee's premises throughout Ireland. In conjunction with the Environmental Protection Agency (EPA), the RPII published a new protocol for licensees holding disused sealed sources, permitting the disposal of these sources to landfill facilities in certain circumstances. Sources eligible for landfill disposal must have decayed to activities below the exemption values in S.I. No. 125 of 2000 and cannot present any environment hazards under the EPA's Hazardous Waste Classification Tool. The RPII will encourage licensees to avail of this disposal protocol through its interactions with licensees during inspections.

During inspections of hospitals, the RPII ensures that appropriate local protocols are available in order that patients who might be pregnant are identified in advance of their examinations or treatments and appropriate actions taken. In December, the RPII published new guidelines on the protection of the unborn child during diagnostic medical exposures. These new guidelines were developed in collaboration with the Medical Council, the Royal College of Surgeons in Ireland, the Irish Institute of Radiography and Radiation Therapy, the Irish Nuclear Medicine Association and the Association of Physical Scientists in Medicine and update guidelines previously issued in 2000. The new guidelines provide a concise summary of the actions to be taken when exposing women of childbearing age to ionising radiation and are intended for use by referring clinicians, radiographers and medical physicists.

The High Activity Sealed Sources (HASS) Directive was transposed into Irish law in December 2005 in the form of the Radiological Protection Act 1991 (Control of High-Activity Sealed Radioactive Sources) Order 2005 (S.I. No. 875 of 2005). The RPII is designated as the Competent Authority for the purposes of the Legislation and the Directive. The Legislation sets out some of the specific requirements of authorisation to hold and use the types of sources that come within the scope of the Directive. During the year, a guidance note and check list intended for holders of HASS was produced outlining the key provisions on record keeping, reporting requirements, as well as training and information.

## Security of Radioactive Sources

The RPII and An Garda Síochána's joint programme of work aimed at assessing current security provisions at licensee's premises with a view to raising the standards to best international security practice was maintained during 2009. A number of improvement measures were made to promote best practice and the implementation of these recommendations will be followed up by RPII inspectors and, where, appropriate, members of the National Crime Prevention Unit.

## Radiation Protection Adviser Register for the Industrial and Educational Sectors

In order to enhance best practice in radiation protection and to address gaps in the regulatory infrastructure, the RPII established a protocol and criteria for approval of Radiation Protection Advisers (RPAs) for the industrial and third level educational sectors and issued a call for applications. The approval scheme also included work activities involving natural radiation. This Category II RPA approval scheme is based on a formal approval of core competence by the RPII. A number of completed applications were received and reviewed by an Assessment Committee. A register of RPAs (Category II) was established at the end of 2009.

## Iodine Holding Tanks

At the start of the year, the RPII set out its recommendations to the Department of the Environment, Heritage and Local Government (DEHLG), in relation to the provision of delay and decay holding tanks for iodine ablation treatment facilities. These holding tanks are used at some centres around the world for the on-site storage of excreta from patients who have been administered therapeutic quantities of iodine-131 for the treatment of thyroid cancers (iodine ablation therapy). The tanks allow the iodine-131 to decay prior to the waste being discharged to the sewers.





The RPII's recommendation to the DEHLG was made following a comprehensive review of the practices in Ireland and throughout Europe related to iodine ablation therapy which was undertaken in 2008. The review found that the benefit, from a radiation protection point of view, of retrofitting holding tanks to existing facilities was grossly disproportionate to the financial and logistical issues involved, and would result in relatively little dose saving. The report also noted that the fitting of holding tanks in new facilities was advantageous but rather than being a mandatory licensing requirement it should be assessed on a case-by-case basis. The DEHLG agreed that this position was consistent with Ireland's commitments under the Oslo Paris (OSPAR) Convention in so far as it concerns the discharge of radionuclides to the marine environment.

### Reportable Doses

It is a condition of each licence that whenever a dose, exceeding a specified reporting level, is recorded on a personal dosimeter a full investigation of the matter must be carried out by the licensee. The reporting levels specified in the licence for wholebody and extremity doses are 2 millisievert (mSv) and 50 mSv respectively over a 16 week period.

The RPII was notified of 17 such cases during the year. Following investigations into each reported dose only five were classified as a dose actually received by the wearer: three industrial radiographers received a reportable dose due to a period involving

a high workload (2.1 mSv, 2.8 mSv and 3.3 mSv, wholebody), an interventional radiologist received a dose to his hands of 53.4 mSv during the period September-December 2008 (this was identified following a review of his dose records undertaken in 2009) and a consultant cardiologist recorded a dose of 2.3 mSv. In the cases of the interventional radiologist and cardiologist their work practices were re-examined by their hospital's RPAs in order to reduce their doses and these individuals will be closely monitored by the hospitals.

### Enforcement

During the year, inspectors visited seven dental practices that had failed to renew their licence when it had expired in September 2008. Three of these enforcement visits resulted in the RPII taking prosecutions through the District Courts against the licensee. In July, The Body Clinic Ireland Ltd was convicted for the unlicensed custody of three dental X-ray units, receiving fines for each of the three offences. A prosecution was taken against an individual dentist, in September for the unlicensed custody of a dental X-ray unit. While the dentist pleaded guilty to the offence the judge applied the Probation Act. The final prosecution was taken against another individual dentist for the unlicensed custody of three dental X-ray units. In this case, the dentist pleaded guilty to each of the offences, however, the judge struck out the proceedings once the dentist had made a donation to Our Lady's Hospital for Sick Children, Crumlin.



## Incidents and Investigations

In April 2009, it was discovered that a lightning preventor containing a low activity radium source was missing from the roof of a building where it was placed under licence. An investigation was undertaken by the RPII and the Company. Relevant agencies within Ireland and abroad were notified. However, the unit has not been recovered to date. A letter of censure was issued to the Company. There are a small number of these devices still remaining in the country and efforts are ongoing to find a suitable disposable route.

In July 2009, the RPII was notified by the Norwegian Radiation Protection Authority (NRPA) of the unauthorised delivery of several thousand ionisation chamber smoke detectors (ICSD) to a company in Norway for disposal from a distributor in Ireland. This matter was compounded by the fact that the Irish distributor had inadvertently failed to renew its existing general licence and also omitted to apply in advance for the necessary Export licence. After consultation with the NRPA, the ICSDs have been returned to Ireland prior to the parent Company resolving a sustainable global disposal solution. The Company has been censured.

## Incidents in the Medical Sector

In March, the RPII published new guidelines on the reporting of radiological incidents. The revised guidelines replace previous guidelines published in 2002 and include more explicit guidance on the types of incidents that are reportable to the RPII in accordance with the provisions of both S.I. No. 125 of 2000 and the conditions attached to each licence. In particular, the guidelines included a specific section on incidents in the medical sector that are also reportable.

During the course of the year, the RPII was notified of 13 incidents which took place in the medical sector. However, an analysis of the causes of the incidents determined that not all of these incidents were in fact reportable due to the fact that five of them concerned incidents involving patients which are outside the remit of the RPII. The majority of incidents that were deemed reportable concerned individuals undergoing radiological procedures where hospital staff incorrectly treated the wrong patient. As these individuals did not receive exposures which were to their benefit they cannot be classified as patients in the context of S.I. No. 125 of 2000 and accordingly can only be considered as members of the public. 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 insofar as is reasonably possible.

The RPII continued to work closely with the HSE's Medical Exposure Radiation Unit during the year on the development of an incident reporting mechanism for incidents falling under S.I. No.

478 of 2002, which deals with the protection of patients undergoing medical exposures involving sources of ionising radiation. It is intended that this incident reporting system will complement the RPII's system and in future years a single incident reporting mechanism will be developed which will address all radiological incidents in the medical sector falling under both S.I. No. 125 of 2000 and S.I. No. 478 of 2002.

## Accreditation

As part of its commitment to continual improvement in quality and consistency of service, the RPII has implemented a quality system for its inspection activities. The system has been developed in line with the requirements of ISO 17020, an international standard specifically designed for inspection bodies. One of the requirements of the standard is that the technical managers within the Regulatory Services Division must witness each inspector within their section carrying out inspections in all relevant sectors. This inspection witnessing programme ensures that there is a consistent approach between inspections and inspectors. During 2009, 11 witnessed inspections were undertaken by the technical managers within the Division.

The RPII's accreditation to ISO 17020 was maintained following a surveillance visit by the Irish National Accreditation Board (INAB) in September. The surveillance visit included INAB assessors witnessing RPII inspectors carrying out an inspection of a dentist and a facility at an airport that used X-ray equipment and facilitated the transit of Class 7 goods.

## Shipments Directive

During 2009, Council Directive 2006/117/Euratom on the supervision and control of shipments of radioactive waste and spent fuel was transposed into Irish law as European Communities (Supervision and Control of Certain Shipments of Radioactive Waste and Spent Fuel) Order, 2009 (S.I. No. 86 of 2009) revoking previous provisions under the European Communities (Supervision and Control of Certain Shipments of Radioactive Waste) Regulations, 1994 (S.I. No. 276 of 1994). The RPII is the Competent Authority for the legislation.

The Directive provides for a compulsory and common system of notification and a standard control document regarding such shipments. In particular, shipments made under the Directive cannot take place until the competent authorities of the country of destination and of any country of transit have notified the competent authorities of the country of origin of their approval. Refusal by a Member State of destination or transit must be justified and be consistent with international law and best practice. The Directive prohibits the export of radioactive waste to

African, Caribbean or Pacific countries, (in line with the Cotonou Agreement), to a destination south of latitude 60° south or to a third country which does not have the resources to manage the radioactive waste safely.

## Radioactive Waste

The RPII continued to highlight the absence of a national storage facility for the interim storage and management of disused sources. It continues to work with the DEHLG to resolve this long-standing issue and participated with other agencies and departments on a High Level Group (HLG) formed to consider the matter and to advise Government accordingly. The HLG is due to report to Government during 2010. As part of that process, the RPII welcomed the opportunity to work with the EPA on a project examining the wider issues of the storage of difficult wastes including disused sources. A consultancy report will be available during 2010 which will contribute to the development of proposals to Government.

## Inter-agency Cooperation

The RPII has reflected in its Strategic Plan and mission statement that engagement with relevant stakeholders is essential in promoting and achieving higher standards in radiation protection. This is particularly relevant in the regulatory environment and during 2009, the RPII met with the HSE, the Dental Council, the Medical Council, the Health and Safety Authority (HSA), the Department of Education and Science, the Garda Síochána and the EPA to discuss areas of mutual interest and to identify joint tasks aimed at generating efficiencies and avoiding duplication of effort.

## International Activities

During 2009, while the RPII maintained its representation at the European Union and International Atomic Energy Agency (IAEA) meetings on transport of radioactive material, it also participated in meetings of the newly established Association of European Competent Authorities for the Safe Transport of Radioactive Material. This is intended to be a network of excellence where regulators can share practical experience.

In March, an RPII staff member participated as an external expert to an IAEA meeting of the heads of 29 regulatory authorities across the continent of Africa, in Pretoria, South Africa. The purpose of the meeting was to create a network of African regulatory authorities, similar to other networks that exist worldwide, with the specific aim of encouraging countries to work together to ensure that radiation protection is afforded the necessary recognition across the continent of Africa. The RPII participant had previously been involved in the creation of the

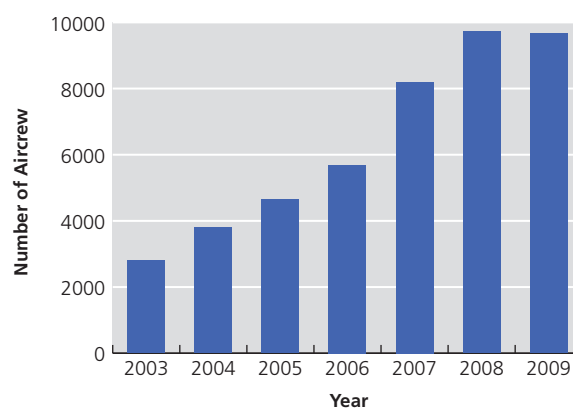
European Radiation Protection Authorities Network (ERPAN) and as the chairperson of ERPAN, was invited to provide advice and guidance to the participants at the meeting as the charter for the new network was developed. The meeting culminated in the creation of the Forum of Nuclear Regulatory Bodies in Africa and the adoption of a charter by which it would operate.

In November, an inspector of the RPII participated as a lecturer in an IAEA funded training programme in Tanzania. This training programme for Radiation Protection Officers in Tanzania was hosted by the Tanzanian Atomic Energy Commission.

## Exposure to Aircrew from Cosmic Radiation

Under S.I. No. 125 of 2000, the holder of an air operator's certificate is required to evaluate doses received by aircrew to determine if measures to control exposure to cosmic radiation are warranted. This requirement applies to those air operators whose aircrew is potentially liable to receive an annual dose greater than 1 mSv, which effectively applies only to those airlines flying above 8000 meters. Doses are estimated by the airlines using internationally recognised software models. For 2009, the information received from seven licensed air operators showed that 9666 individuals were estimated to receive annual radiation doses above 1 mSv. Of these, 2917 received between 1 and 2 mSv, while 6035 received doses between 2 and 4 mSv and 714 received doses over 4 mSv. No doses over 6 mSv were reported. 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 (Figure 3). This can be attributed to an increase in the number of aircrew required for the operation of new and existing routes as the demand for air travel increases.

**Figure 3: Number of aircrew receiving radiation doses greater than 1 mSv**



# Exposure of the Irish Population to Radiation

## Environmental Monitoring

The RPII carries out an environmental monitoring programme to assess the levels of radioactivity in air, food and water. The primary focus of this programme is the assessment of human exposure and the protection of human health. The programme aims to meet Irish and European Union legal requirements, other national and international commitments and to support the RPII's advisory and information provision functions. Furthermore, the programme allows the RPII to maintain systems and procedures which would allow a rapid assessment of environmental contamination to be made in the event of a radiological emergency.

This programme involves the sampling and testing for radioactivity in air, drinking water, foodstuffs, fish, shellfish, seaweed, sediments and seawater as well as the continuous measurement of external gamma radiation at monitoring stations around the country. Artificial radioactivity is present in the environment due to; among other things, the testing of nuclear weapons, past nuclear accidents such as Chernobyl and routine discharges from nuclear installations. Liquid discharges from the Sellafield nuclear fuel reprocessing plant in the northwest of England remain the dominant source of artificial radioactivity in the Irish Sea. The marine monitoring data show that the consumption of seafood remains the main pathway contributing to public exposure arising from discharges of artificial radioactivity to the marine environment.

The habits survey carried out in 2008 identified two critical groups, commercial fishermen (Group A) and commercial oyster and mussel farmers (Group B) working along the north east coast. Dose assessments were carried out for both these groups. In 2009, the committed effective doses estimated for Group A and Group B were 0.25 microsievert ( $\mu\text{Sv}$ ) and 0.51 ( $\mu\text{Sv}$ ), respectively. To allow comparison with previous years, the doses for the typical

consumer of seafood from the Irish Sea of 0.1  $\mu\text{Sv}$  is included. Annual committed effective doses to typical seafood consumers due to caesium-137 between 1982 and 2009 are shown in Figure 4.

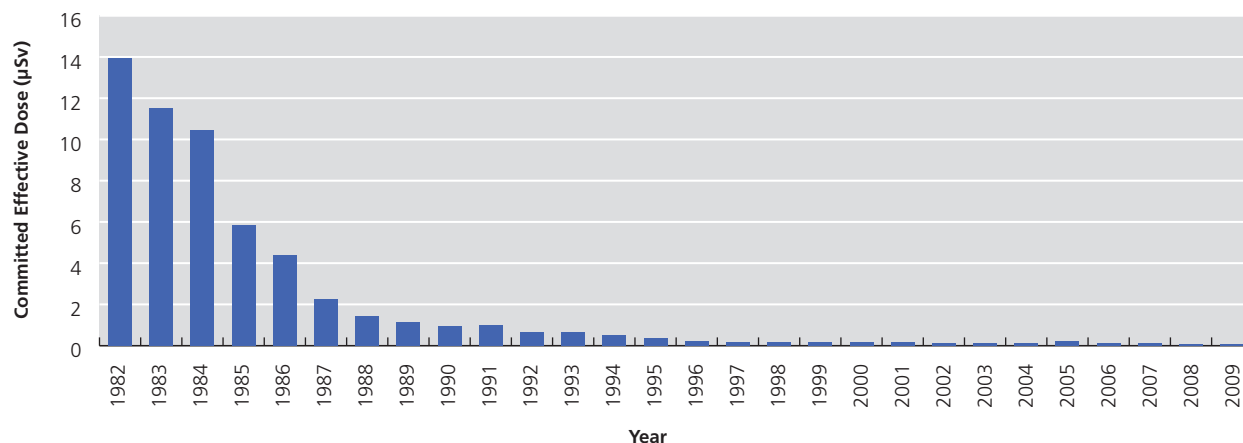
The RPII, with the assistance of Met Éireann and a number of local authorities, operates a Permanent Monitoring Station Network which includes continuous measurement of ambient gamma dose rate, airborne particulate sampling for assessment of radioactivity in air and collection of rain water. During 2009, ambient gamma dose rate was measured at 15 stations and radioactivity in air was measured at 12 stations. No abnormal levels of ambient gamma dose rate were observed during the period. Levels of airborne radioactivity measured were all low and consistent with measurements in previous years.

The RPII implements a systematic programme of monitoring radioactivity in milk, drinking water and mixed diet consisting of complete meals sampled from university canteens. In addition, a wide range of other food types are regularly tested. The results of these analyses show that levels of radioactivity in foodstuffs continue to be very low. The RPII's monitoring programme shows that the doses incurred by the Irish public as a result of artificial radioactivity in the environment do not constitute a health risk and are very small compared with the dose received as a result of background (natural) radiation. All results are published in a series of monitoring reports which are available on the RPII's website, [www.rpii.ie](http://www.rpii.ie).

## Radioactivity in Groundwater Sources

A national study of radioactivity in groundwater supplies commenced in 2008. This study is scheduled to run until 2010 and is being undertaken with the cooperation of the EPA who will measure chemical parameters including uranium for the same

**Figure 4: Committed effective doses to typical seafood consumers due to caesium-137, 1982-2009**





*Prof. Alan Reilly (FSAI) and Dr Ann McGarry (RPII) signing the Memorandum of Understanding between the FSAI and the RPII*

supplies. In 2009, samples from 98 locations were collected and analysed for their total alpha and total beta activity. The World Health Organisation (WHO) guidelines on drinking water quality were used as a basis to evaluate these data. Locations, for which the measured total alpha and total beta activities exceeded the WHO screening levels, were identified for further investigation in later phases of the project. For all of the samples tested, the measured gross beta activities were below the WHO screening level of 1.0 becquerels per litre (Bq/l), while 82 were below the WHO screening level of 0.1 Bq/l for gross alpha activity thus identifying the need for further investigation at 16 locations. Further sampling at these locations has been arranged and analysis will be completed in 2010.

### **Revised Memorandum of Understanding between the RPII and the Food Safety Authority of Ireland (FSAI)**

The RPII and the FSAI have had a Memorandum of Understanding (MoU) in place since 2001 and the objective of this MoU is *"to cooperate and work closely together in order to promote, encourage and foster the establishment and maintenance of high standards of food hygiene in the interests of and for the protection of public health by ensuring that food ... meet the*

*highest standards of food safety and hygiene insofar as radioactivity levels are concerned"*. To date, this MoU has served both organisations well and has resulted in productive collaboration and excellent working relations between staff in the two public bodies. At the bi-lateral meeting in 2008 both parties agreed to jointly review and update the MoU. This review took place in 2009 and a revised MoU was agreed in December. The changes in the revised MoU include clearer elaboration of the responsibilities of both authorities under EU and international legislation, identification of areas of shared interest and a more detailed framework for meetings between the two bodies.

### **Peer Review of Monitoring Programmes**

Since the RPII's environmental radioactivity monitoring programme started in the early 1980s, it has evolved to reflect, among other things, changes in the levels and radionuclides discharged abroad and available resources. At an operational level the monitoring plan is reviewed annually and, as recently as 2007, aspects of the programme were positively reviewed by a team of experts from the European Commission as part of a verification mission under the Terms of Article 35 of the Euratom Treaty.

In order to take stock of the programme at a strategic level, in 2009 the RPII had the scope and effectiveness of its monitoring programme reviewed by an international peer group. The key objective of the review was to consider whether the RPII environmental monitoring programme is meeting its stated aims and objectives and to provide recommendations for improvement if required.

The review panel included five independent experts from Ireland, the United Kingdom and Denmark, selected on the basis of expertise and knowledge in a range of topics related to radiation protection and environmental monitoring. The group broadly endorsed the RPII monitoring programmes and considered that the current programme was both adequate and justified, both from the perspective of public reassurance and from the need to provide accurate and scientifically-sound advice to Government. The group was also impressed with many aspects of the RPII's work related to the monitoring programme including the quality system, intercomparison work and its rate of publications in peer reviewed journals.

The group made some specific recommendations in relation to reprioritisation of sampling, use of bio-indicators and batching of samples. The group stressed the importance of maintaining and developing staff and commended the RPII for the project-based work undertaken and the obvious benefits which have accrued. The group felt that it was important to identify key analytical skills necessary to support the programme and ensure that staff had appropriate training and practice to maintain those skills. It further recommended that RPII continue to enhance collaboration with universities and third level institutions in Ireland and with sister organisations internationally.

## Occupational Exposure from Dosimetry Measurements

The Dosimetry Service provides a personal monitoring service for the determination of occupational exposure to ionising radiation. In 2009, 181 or 2.2% of individuals monitored by the Dosimetry Service received annual doses exceeding the minimum reporting level of 0.1 mSv. Of these, 35 workers from medical and industrial sectors received annual doses exceeding the dose limit for members of the public of 1 mSv. The highest annual individual dose measured during 2009 was 3.3 mSv received by an industrial radiographer.

Ninety three individuals working in industrial, medical, veterinary and research fields received measurable extremity doses. The highest annual dose was 46.6 mSv to the right hand of a medical physicist.

These doses may be compared with the annual dose limits for wholebody and extremity doses to workers exposed to ionising radiation of 20 mSv and 500 mSv, respectively.

## International Activities

The RPII continued to participate in a number of international activities related to population dose and environmental monitoring. In 2009, these included the Nuclear Energy Agency (NEA) Expert Group on the Implications of International Commission on Radiological Protection (ICRP) Recommendations (EGIR) and the IAEA's Radiation Safety Standards Committee (RASSC), both of which focused on the development of revised International Basic Safety Standards based on the 2007 recommendations of the ICRP. During 2009, the RPII's laboratory joined the IAEA's ALMERA (Analytical Laboratories for the Measurement of Environmental Radioactivity) network of laboratories. This network aims to support member laboratories through developing standardised methodologies and through organising interlaboratory comparison exercises and proficiency tests. Other international activities during 2009 included participation in the Article 35/36 Member States representative group, the NEA Expert Group on Occupational Exposure and the European External Dosimetry Group (EURADOS).



# Radon

## Introduction

Radon is the main source of radiation exposure to the Irish population, accounting for 56% of the total dose from all sources. It is a naturally occurring, radioactive gas that originates from the uranium present in all rocks and soils. The RPII's strategic objectives on radon set out in its 2008-2011 Strategic Plan include working to increase awareness among all key stakeholders of the RPII's advice on radon and encouraging the adoption and implementation of a National Radon Control Strategy by Government. An important element of the RPII's work over this period was the development of strategic relationships with other public agencies aimed at furthering these objectives. Specifically, during 2009, the RPII worked closely with the HSE, Local Authorities, the HSA and the Department of Communications, Energy and Natural Resources (DCENR).

## Engagement with Other Public Bodies and Organisations

### Health Service Executive

Under the terms of the Memorandum of Understanding, a working group on radon was set up with the HSE. The main work of this group, which met nine times during 2009, was the development of a joint position paper on radon. This important statement recognises radon as an important public health hazard which requires a coordinated national response. The document

specifically recommends the establishment of an appropriately constituted group comprising relevant public authorities tasked with driving the development of a National Radon Control Strategy for Ireland.

### Department of Communications, Energy and Natural Resources

During 2009, the RPII and the DEHLG submitted a joint proposal to DCENR on the need to assess the possible impact on indoor radon levels of retrofitted homes with insulation to improve energy efficiency. The proposal highlighted a lack of data applicable for countries with climates like that of Ireland and identified a need for research. The key recommendation was that research was needed and a pilot research project should be conducted in cooperation with DCENR.

### Health and Safety Authority (HSA)

The Memorandum of Understanding with the HSA provides for the establishment of a working group on radon. Under the aegis of this working group, regional meetings were completed with HSA inspectors during 2009 to provide them with information on radon. These meetings aimed to support the inclusion of radon in HSA inspections of workplaces. During 2009, the HSA included radon in some 619 inspections and this, in turn, gave rise to a noticeable increase in the number of enquiries to the RPII on radon from employers. This work will continue in 2010.



## Local Authorities

During the year, the RPII published a guide for local authorities on the implementation of radon measurement programmes in social housing. In parallel with the development of this guide, an extensive programme was conducted to raise awareness with local authorities of the need to address radon in social housing. Priority was given to counties with high radon levels, in which radon in social housing had not so far been addressed. Specifically, during 2009 work was undertaken with local authorities in Carlow, Clare, Kerry, Galway, Louth, Sligo, Wicklow, Wexford and Waterford. The RPII continues to support local authorities in their efforts to address radon in their workplaces and in social housing.

## International Activities on Radon

In September, the World Health Organisation (WHO) published its Handbook on Indoor Radon a Public Health Perspective. This important publication is a key product of the International Radon Project which was co-sponsored by the Irish Government who provided financial and technical support mainly through the auspices of the RPII. The Handbook sets out a framework for development of national radon programmes and can be used as a guide to the development of a national radon strategy in Ireland. During 2009, the RPII also actively contributed to the development of radon policies by a number of international bodies including International Commission on Radiological Protection (ICRP), IAEA and the European Commission.

## Radon Measurements and Conveyancing of Properties

During 2009, the RPII reviewed how including radon disclosure in the conveyancing process could be used as a tool to increase the rate at which homes with high radon concentrations are identified. This review looked at countries, such as England and Wales, where this type of requirement had been implemented. In these countries, it was found that the inclusion of radon in conveyancing was key in raising awareness of radon among homebuyers and in increasing the number of radon measurements. It was estimated that if similar measures were introduced in Ireland the time needed to measure the present national housing stock could be reduced from 400 years at the current rate of measurement to 40 years.

It is widely recognised that in order to make an accurate assessment of the long-term radon concentrations in a house, it is necessary to measure radon over a period of at least three months. This is sometimes seen both in Ireland and internationally as a barrier to inclusion of radon disclosure in the conveyancing process. During 2009, research was carried out in cooperation with UCD to investigate whether a shorter screening type

measurement could be used during the conveyancing process. Under such a scheme houses with radon levels significantly below the Reference Level could be cleared using a screening measurement, while other houses would still require a full three month measurement.

## National Radon Forum

The 2009 National Radon Forum was held in Dublin in November with the theme "Towards the development of a radon control strategy for Ireland". This seventh forum was opened by Mr Michael Finneran, TD, Minister of State at the Department of the Environment, Heritage and Local Government, with special responsibility for Housing, Urban Renewal and Developing Areas. The Forum brings together those with a role in reducing the risk from radon in Ireland including measurement companies, remediation companies, researchers, public representatives, local authorities, the public and agencies with responsibility for building standards and health and safety. The forum heard talks from RPII and HSE on the development of a radon control strategy for Ireland and what such a strategy might contain. This was followed by a presentation on the use of cost effectiveness analysis in developing a radon control strategy by Professor Alastair Gray of the Health Economics Research Centre, University of Oxford. In opening the forum, Minister Finneran pointed out that the input from many national agencies and other key stakeholders is needed to effectively address the radon problem.

## Radon Measurement Statistics and Public Awareness

In October, two homes in Tralee were identified as having extremely high radon levels. One home had 8500 becquerels per cubic metre ( $\text{Bq/m}^3$ ) and the second home had 14,000  $\text{Bq/m}^3$  which is among the highest radon levels ever found in Ireland. These levels can be compared with the Reference Level, 200  $\text{Bq/m}^3$ . Very high radon levels were also identified in homes in Tubercurry, Co. Sligo (2900  $\text{Bq/m}^3$ ), in Ballymote, Co. Sligo (2800  $\text{Bq/m}^3$ ), in Claremorris, Co. Mayo (3200  $\text{Bq/m}^3$ ), in Ennis, Co. Clare (2200  $\text{Bq/m}^3$ ), near Tramore Co. Waterford (3100  $\text{Bq/m}^3$ ) and in Clonmel Co. Tipperary, (2900  $\text{Bq/m}^3$ ).

In each case, the RPII issued a press release and engaged with local media to promote awareness of the radon risk locally. In Tralee, given the extremely high levels found, the RPII in cooperation with local TD, Mr Jimmy Deenihan, held a public meeting in the town. The meeting was very well attended and allowed the local public to ask questions regarding their radon risk in light of the extremely high reading. In cooperation with Cobh Town Council a public meeting was held in Cobh in February on the risk in the area.

Table 2 summarises RPII radon measurements to 31st December 2009<sup>1</sup>. Of the approximately 37,575 results, some 11,300 were carried out as part of the National Radon Survey. The remainder are largely fee paying measurements. To date, only 4921 of the estimated 91,000 homes with radon concentrations above 200 Bq/m<sup>3</sup> have been identified. Of these, 491 are above 800 Bq/m<sup>3</sup> and considered very high. Those counties with the highest percentage of homes identified above the Reference Level are Sligo (24%), Waterford (22%), Galway (21%), Carlow (17%), Wicklow (17%), Mayo (16%) and Wexford (15%). During 2009, high radon concentrations were measured in 313 homes.

**Table 2: Distribution of radon measurement results by county (based on measurements completed up to 31st December 2009)**

County	Number of houses in categories of radon concentration					
	Number of houses measured	% of homes >200 Bq/m <sup>3</sup>	0-199 Bq/m <sup>3</sup>	200-800 Bq/m <sup>3</sup>	>800 Bq/m <sup>3</sup>	Highest measured concentration (Bq/m <sup>3</sup> )
Carlow	700	17	575	115	6	1700
Cavan	365	3	350	10	0	800
Clare	3250	11	2890	305	59	3500
Cork	4425	11	3930	460	34	4500
Donegal	1180	5	1125	55	0	500
Dublin	2470	6	2315	155	1	1400
Galway	4770	21	3775	885	105	3400
Kerry	3120	14	2680	340	94	49,000
Kildare	985	5	935	45	3	1100
Kilkenny	935	13	815	115	6	2400
Laois	490	3	470	15	0	600
Leitrim	300	7	280	20	1	1600
Limerick	1050	7	970	75	3	1900
Longford	270	8	250	20	1	900
Louth	585	12	510	70	0	700
Mayo	3095	16	2590	470	33	6200
Meath	725	9	660	60	2	900
Monaghan	255	6	240	15	0	800
Offaly	420	2	405	10	0	500
Roscommon	530	10	475	50	2	1400
Sligo	1470	24	1115	295	56	5500
Tipperary	1615	11	1435	165	14	2400
Waterford	1085	22	845	205	34	9700
Wexford	1300	15	1105	175	17	2900
Westmeath	555	8	505	45	0	700
Wicklow	1630	17	1355	255	20	16000
<b>Total</b>	<b>37,575</b>	<b>13</b>	<b>32,600</b>	<b>4430</b>	<b>491</b>	

<sup>1</sup> The number of homes in the columns has been rounded down to the nearest 0 or 5. The true number is therefore slightly greater than the figure shown. The exception to this is the column headed homes greater than 800 Bq/m<sup>3</sup> where the relatively low numbers did not need rounding down.



## National Thoron Survey

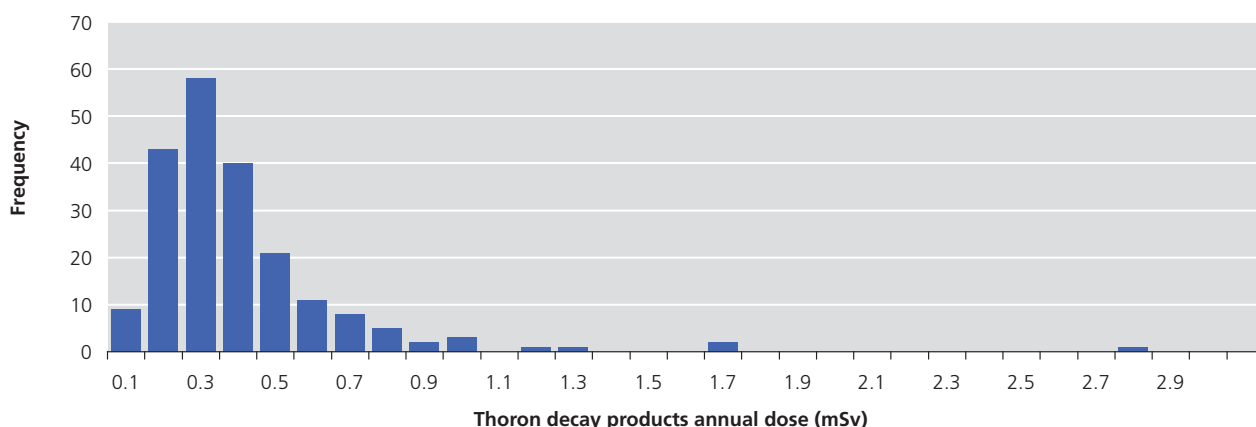
Measurements of thoron gas, thoron decay products and radon gas in 205 Irish homes from around the country were completed in 2009 for the National Thoron Survey. This survey, which is a collaborative project between the RPII, UCD and the National Institute of Radiological Sciences in Japan, is one of the most comprehensive of its kind undertaken anywhere in the world.

The principal source of thoron gas in homes is naturally occurring thorium in building materials. Unlike radon, the local geology has little influence on the levels of thoron in homes because the short half-life of thoron (55.6 seconds) means that most of it has decayed by the time it migrates from the underlying soil into the home.

The short half-life of thoron also means that it is the decay products and not thoron itself that contribute to the radiation dose. Figure 5 shows the distribution of estimated annual doses from thoron decay products in this study.

From this study, the average dose due to thoron decay products was estimated to be 0.35 mSv/year. This represents approximately 10% of the total average dose from all sources to the Irish population. The maximum dose in this study from thoron decay products was 2.8 mSv/year. These may be compared to a dose of 5 mSv/year from indoor radon concentrations at the national Reference Level i.e. the level above which remediation is recommended, of 200 Bq/m<sup>3</sup>.

**Figure 5: Thoron decay products annual dose (mSv)**



# Radiation Measurement Services

## Introduction

The RPII provides a range of radiation measurement services including: personal dosimetry, instrument calibration, radon measurement, product certification and analytical services. These services are used to support the RPII's own programmes and are also provided on a commercial basis to customers including hospitals, industry and educational establishments. During 2009, the Board approved the establishment of a subcommittee to review the provision of commercial services by the RPII. The subcommittee presented an interim report to the Board in July in which, for each of the services currently provided, it examined the rationale for providing the service, contribution to income and sustainability of the service into the future.

The RPII is committed to maintaining high quality standards for all of its measurement activities. The RPII's laboratory quality management system is accredited to ISO 17025 by INAB. The RPII takes part in a broad range of laboratory intercomparison programmes organised by the IAEA, the European Commission and other national agencies. Participation in the international technical expert networks is also seen as vital to maintaining a high quality of service and during 2009 the RPII participated in a number of such groups relevant to each area of its activities.

## Analytical Services

The RPII measures radioactivity in a wide range of foodstuffs and environmental samples. This work is undertaken both in support of the RPII's environmental radioactivity monitoring programme and on a contract basis on behalf of external clients. The contract analytical services provided during 2009 included: testing of Irish produce for compliance with the requirements of importing countries, testing of drinking water for compliance with the requirements of the European Communities Regulations, testing of wipe tests for radioactive sources, testing of dredging samples for compliance with the requirements of the Dumping at Sea Act, 1996, and measurement of radon in drinking water. In total, 1894 samples were tested during the year and Table 3 presents the breakdown of this number by sample type. The RPII provides a certification service to exporters of Irish foodstuffs and other produce. The number of product certificates issued in 2009 was 3198. This may be compared with 3301 in 2008, 3445 in 2007 and 4229 in 2006 and indicates a continued gradual decrease in demand for this service.

During 2009, the RPII continued its participation in international technical expert networks relevant to analytical services including the Analysts Informal Working Group (AIWG) run by the UK Health Protection Agency (UK-HPA) and the Nuclear Spectrometry User Forum and Liquid Scintillation User Forum hosted by the UK National Physical Laboratory (UK-NPL).

**Table 3: Radioactivity testing on environmental samples and foodstuffs, 2009**

Sample Type	Number
Air filter samples	429
Environmental samples – terrestrial & marine	425
Wipe test samples	371
Contract samples	669
<b>Total</b>	<b>1894</b>

## Personal Dosimetry

In 2009, the Dosimetry Service issued approximately 78,000 wholebody, extremity and neutron dosimeters for over 8000 individuals in Ireland. This represented a decrease in the number of dosimeters which were issued in 2008 and 2007 at 92,000 and 84,000, respectively. This decrease may be attributed to recent changes in the dosimetry market in Ireland.

In 2009, the Dosimetry Service introduced a number of new customer service driven initiatives including the introduction of coloured holders for wholebody dosimeters and an online facility on the RPII website for Dosimetry Service customers to request amendments to their accounts. An annual invoicing scheme which offered discounts to many customers was also introduced.

Participation in international dosimetry groups is seen as vital to maintaining a high quality of service to customers and the Dosimetry Service staff continued to participate at Council level in the European Radiation Dosimetry Group (EURADOS) and in the Personal Radiation Monitoring Group (PRMG).

## Calibration Service

In 2009, 419 instruments were tested by the Calibration Service for compliance with the relevant manufacturer's specifications.

A new track beam irradiation system manufactured by Hopewell Designs Inc. in the United States was commissioned in 2009. This new system is more automated than the irradiator it replaces and it allows calibration to lower dose rates to be achieved.

In 2009, Calibration Service staff continued to be members of the International Atomic Energy Agency Secondary Standard Dosimetry Network, IAEA SSDL, the Ionising Radiation Metrology Forum, IRMF, and the European Metrology group EURAMET.

## Radon Measurement

The RPII provides a radon in air measurement service for homes, workplaces and schools. In 2009, radon measurements were completed in 2550 homes, of these 1910 were routine home measurements while the remainder were carried out for research purposes. 302 workplaces were measured for radon of which 39 were schools.



# Emergency Preparedness

## Introduction

Under the National Emergency Plan for Nuclear Accidents (NEPNA), the RPII is responsible for assessing the impact on Ireland of any nuclear accident taking place abroad and offering advice on protective actions that might be considered. In support of these functions, the RPII operates a Permanent Monitoring Station Network (as shown in Figure 6), maintains emergency procedures and regularly participates in national and international emergency exercises. The RPII also plays a very active role in national initiatives linked to the NEPNA and other emergency planning groups. The linkages between these groups are shown in Figures 7 and 8 for emergency response and planning, respectively.

**Figure 6: RPII Permanent Monitoring Station Network**



## RPII Emergency Plans

All Government Departments and agencies with responsibilities under the NEPNA are required to have written sub-plans showing how they will carry out these responsibilities. In 2009, the revised RPII sub-plan was finalised and approved for adoption. In 2010, it

is planned to organise training for all RPII staff on their roles in the emergency plan. As part of its emergency plan, the RPII operates a duty officer system whereby a senior manager of the RPII is always on call. The technological requirements for the execution of this role were reviewed and a series of recommendations prepared for implementation in 2010. The recommendations included updating the duty officers' mobile phones to email- and web-enabled phones.

## Agriculture and Food Handbook

In 2009, the Department of Agriculture, Fisheries and Forestry (DAFF) established an expert Project Group to produce a customised Irish version of the more general "Generic Handbook for Assisting in the Management of Contaminated Food Production Systems in Europe following a Radiological Emergency" which was prepared as part of an EU project (EURANOS). The Irish Project Group consists of DAFF experts from across all sectors of the Irish food production industry (crops and animals), together with experts from the RPII, the FSAI and the DEHLG. The Irish Handbook will cover a range of scenarios with the potential for radioactive contamination of the Irish food production systems and will be used to enhance plans for response to nuclear and radiological accidents. It will also be a valuable resource for training and nuclear emergency exercises.

## Emergency Exercises

The RPII runs an annual programme of emergency exercises to maintain staff expertise. These exercises include rehearsing aspects of the RPII's emergency plans, such as initial notification of the RPII's duty officer, assessment of a simulated nuclear accident using computer prediction tools and use of the dedicated communication links with the National Emergency Coordination Centre.

In addition, to its internal emergency exercises, the RPII also participated in eight international emergency exercises organised by the International Atomic Energy Agency (ConvEx exercises) and the European Commission (ECURIE exercises). Of particular note was the ECURIE Level-3 exercise in November 2009. This exercise was designed to test the ECURIE information exchange procedures in a situation where abnormal radiations levels are detected in a popular tourist area in an EU country. The one-day exercise was a very useful test of information sharing on national responses to an incident that could affect many countries' citizens abroad. The RPII's response focussed on assessing the situation and advising on guidance to be issued to Irish citizens in the affected area. The European Commission's exercise evaluation report commended the Irish Competent Authority (RPII) for a very well formatted and informative press release.

## Emergency Alerts

There are two independent international systems in place for rapid notification of any radiological emergencies with potential cross-border impacts. These are operated by the IAEA in Vienna (EMERCON) and the EC in Luxembourg (ECURIE). These systems operate continuously and are regularly tested and updated (for example, communications channels for the EC system are tested automatically on a daily basis). The messages communicated via these systems have different levels of urgency, with an 'alert' being the most urgent. There were no EMERCON or ECURIE alerts in 2009.

**Figure 7: Strategic structures and linkages for emergency response**

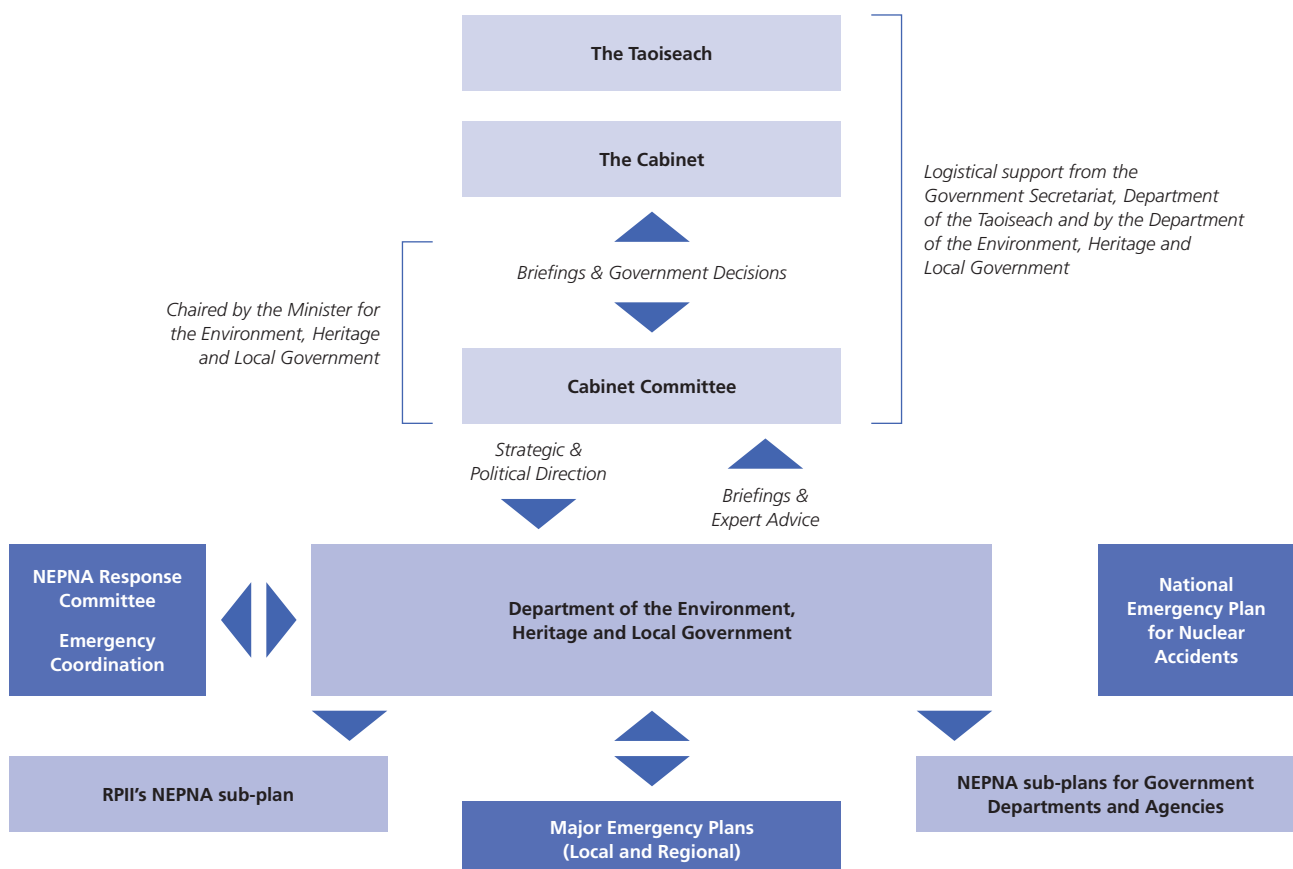
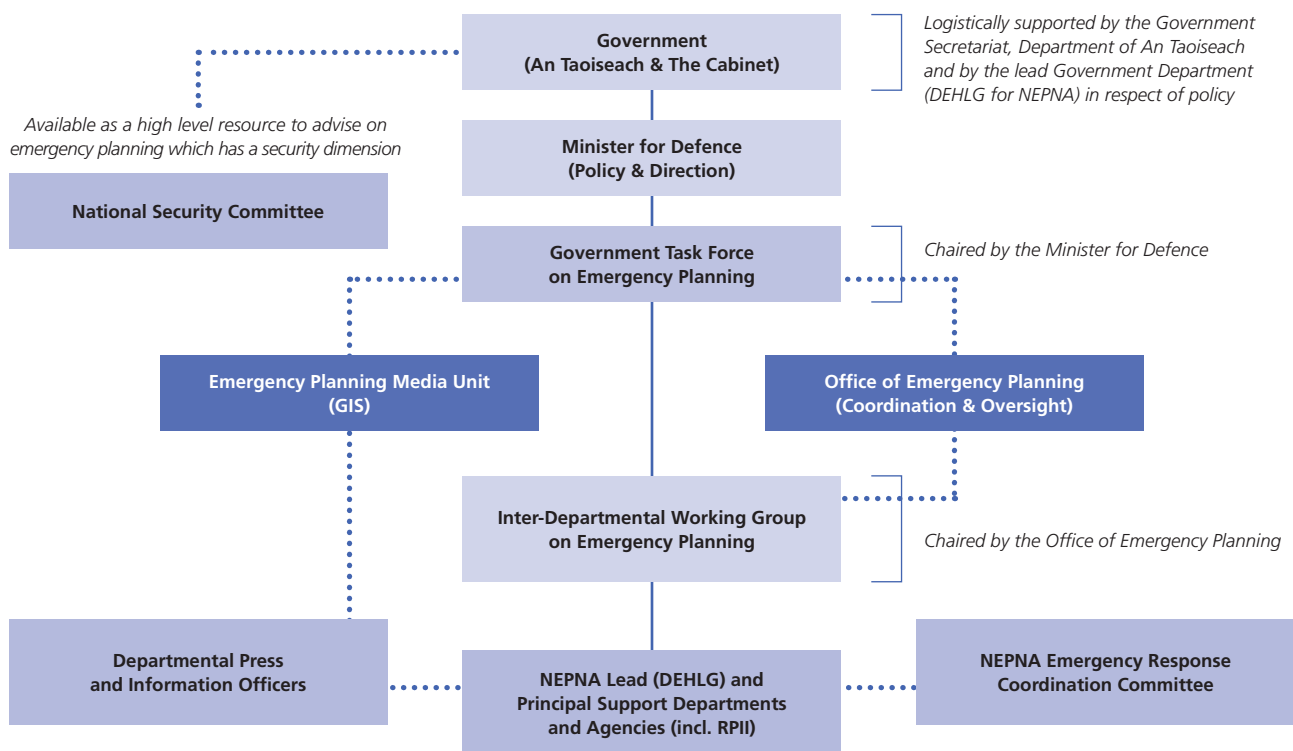




Figure 8: Strategic structures and linkages for emergency planning



# Safety of Nuclear Facilities Abroad

The RPII has a statutory responsibility to monitor developments in relation to nuclear safety and to advise Government in that regard. The RPII exercises these functions through liaison with nuclear regulators and visits to nuclear facilities abroad. The RPII also reviews the technical and scientific literature so that it is fully briefed on all international issues and their potential implications for Ireland.

## European Community Framework for Nuclear Safety – the Nuclear Safety Directive

On the 25th June 2009, the European Council adopted a Directive (Directive 2009/71/EURATOM) establishing a Community framework for the safety of nuclear installations. The primary objectives of the Directive are to maintain and promote the continuous improvement of nuclear safety and its regulation. EU Member States must provide for appropriate national nuclear safety frameworks that ensure a high level of nuclear safety to protect workers and the general public against the dangers arising from nuclear installations. Member States are further required to encourage a high level of transparency of regulatory actions and to guarantee regular independent safety assessments. The Directive essentially gives legal force to the main international nuclear safety standards developed in the 'Safety Fundamentals' established by the International Atomic Energy Agency (IAEA) and the principal obligations provided for in the Convention on Nuclear Safety. The RPII contributed to the development of the Directive through its involvement in the European Nuclear Safety Regulators Group (ENSREG). The Directive is due to be implemented by Member States by 22 July 2011.

## Nuclear Safety in the UK

The RPII continues to closely monitor developments at Sellafield and other UK nuclear sites. At Sellafield, particular attention is given to progress in emptying the Highly Active Storage Tanks (HASTs) which contain large amounts of liquid radioactive waste that is produced as a result of reprocessing spent fuel. The HASTs are emptied by sending the liquid waste to vitrification (i.e., incorporation into glass blocks). The UK's Health and Safety Executive-Nuclear Directorate (UK-HSE-ND) specifies strict limits on the amount of liquid waste, that can be stored in the HASTs at any given time and this limit gets stricter with time to an ultimate limit of just a "buffer" volume of 200 m<sup>3</sup> by 2015. The RPII is kept fully informed on progress in reducing the volume of liquid waste stored in the HASTs. Technical problems during 2009 with the Highly Active Liquor Evaporation and Storage (HALES) facility resulted in lower than anticipated vitrification throughput. Coincidentally, over the same period there has been reduced

spent fuel reprocessing. Hence the HAST volumes have remained relatively constant throughout 2009.

There was a gradual increase in discharges of antimony-125 (Sb-125) to the air due to reprocessing of a form of spent Magnox fuel containing higher levels of radioactivity than usual. This resulted in a temporary suspension of Magnox reprocessing operations in April 2009 in order to prevent breaching of the annual discharge limit. After an assessment of the issue, the UK's Environment Agency (UK-EA) considered the radiological impact on people and the environment of the temporary breach of the Sb-125 discharge limit from the increased discharges to be small compared to the consequences of not reprocessing spent Magnox fuel. Accordingly, reprocessing operations resumed during the summer of 2009. In order to assess the potential impact on Ireland of these increased discharges of Sb-125, the RPII simulated the atmospheric dispersion of the anticipated peak discharges and confirmed that the resulting air concentrations are of negligible radiological consequence.

The RPII also continues to monitor the development of plans in the UK to build new nuclear power plants to replace those that are scheduled to close over the next 20 years. The UK is currently evaluating two reactor designs (Areva's European Pressurised Reactor (EPR) and the Westinghouse AP-1000) for conformance with the UK regulatory regime in a process of Generic Design Assessment (GDA). This design assessment, currently in the final stage of a four step process, is scheduled to be completed by June 2011. In April 2009, the UK's Department of Energy and Climate Change (UK-DECC) announced the locations of the potential sites which have been identified in conjunction with potential operators and the UK Nuclear Decommissioning Authority (UK-NDA). Ten sites are currently considered to be sufficiently developed both in terms of their locations and current utility to be suitable for the deployment of new nuclear power stations by the end of 2025.

## UK Environment Agency Inspection of Sellafield

The UK Environment Agency (UK-EA) performs periodic team inspections of Sellafield and other nuclear sites to assess compliance with the limits and conditions of authorisations held by the site operators. These team inspections are in addition to the ongoing inspections that are performed by individual regulators. Team inspections typically focus on a specific part of an authorisation (e.g. solid, aqueous or aqueous waste) or on a specific area of the nuclear site.

In June 2009, a UK Environment Agency Team, supported by the UK Health and Safety Executive Nuclear Directorate (UK-HSE-ND),



undertook a team inspection of the aqueous waste management arrangements at Sellafield. The UK-EA invited two observers from the RPII to participate in the week-long on-site portion of the team inspection. The key specific objectives of the inspection were to assess compliance against the required regulations, assess progress against previous inspection recommendations, promote good/best practice and promote continual environmental improvement.

The on-site inspection was a mixture of pre-arranged inspections and inspections of facilities that were not announced until the morning of the visit. The observations from the individual inspections and overall inspection findings were reported by the UK-EA to Sellafield through a series of meetings and as a written report. The overall assessment by the UK-EA was that the system to ensure control of discharges below limits and to maintain accurate records of those discharges is effective and that current compliance with the regulations has improved significantly since 2005. However, the inspection report did note a number of areas where Sellafield should take action to demonstrate continued application of Best Available Techniques (BAT) as required under the regulations on environmental discharges.

### UK-HSE-ND's IRRS Self-Assessment

The IAEA offers an Integrated Regulatory Review Service (IRRS) which compares the nuclear/radiation regulatory infrastructure in a State against international standards and guidance and where

appropriate, good practice elsewhere. In preparation for the UK's nuclear safety IRRS mission, the UK-HSE-ND undertook a self-assessment against the existing IAEA standards for nuclear regulators. The RPII and the Spanish nuclear regulator, Consejo de Seguridad Nuclear (CSN), were invited to participate in a two-day workshop which was held as part of the self-assessment process. Following the self-assessment, the IAEA's peer-review visit was completed in October 2009 and a report on the findings published in early 2010.

### Nuclear Incidents

Through its Memorandum of Understanding with UK-HSE-ND and ongoing liaison with the UK-EA, a number of incidents at Sellafield and other UK nuclear sites were brought to the attention of the RPII during the course of the year. These included two events rated as Level 2 on the seven-point International Nuclear Event Scale (INES). A level 2 event is the second lowest point on this scale and is classified as an 'incident'. One of the incidents was the detection in January 2009 of a radioactive leak (a steady drip for a long period of time) causing some ground contamination in the Magnox facilities at Sellafield. In addition, there was an incident demonstrating degradation of the safety in-depth at Dungeness B nuclear power plant in June 2009 due to an intervention to deal with a fuel element problem in the reactor. In addition to these events, there was a loss of cooling water supplies to the Highly Active Liquor Evaporation and Storage plant at Sellafield in April 2009. The event was a result of incorrect



control valve settings following a maintenance event. The cooling water was restored after 8 hours. This event was provisionally rated as INES Level 1 ('anomaly') but a final rating is still awaited pending the completion of the investigation of the incident by the UK-HSE-ND. None of these incidents had offsite consequences and, therefore, had no radiological impact on Ireland.

In addition to the UK events, the RPII was also informed of a number of Level 2 nuclear events in other countries through the IAEA's Nuclear Events Web Based System (NEWS). These included an overexposure incident at the Beznau nuclear power plant (NPP) in Switzerland; failure in fissile material accountability in Cadarache, France; a loss of cooling event at the Cruas NPP in France; an irradiation incident in Fleures, Belgium; violation of criticality safety controls in Marcoule, France; and an instrument drop from a crane at the PAKS-4 NPP, Hungary. Again, none of these incidents had offsite consequences and, therefore, had no radiological impact on Ireland.

### Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management is the international convention which obliges all participating countries (Contracting Parties) to maintain a high level of safety in spent fuel and radioactive waste management and report on measures taken in this respect. The Convention is relevant to Ireland as radioactive material is widely used in medicine, research, and industries throughout the country. The Convention includes obligations in the areas of the national regulatory framework, transboundary movement of spent fuel and radioactive waste, and on the safe management of disused sealed sources. The Convention came into force in 2001 and every three years Contracting Parties, including Ireland, submit a national report that sets out measures planned and adopted by that country to implement the relevant obligations of the Convention. These national reports are peer-reviewed by other Contracting Parties and questions are put to the countries on their reports and national waste management programmes. The third review meeting took place in May 2009 in Vienna.

RPII staff participated in the process by contributing to the preparation of Ireland's national report, reviewing, and posing questions on other national reports, presenting Ireland's report and participating in the discussions during the review meeting. In addition, one staff member acted as Rapporteur (Scientific Secretariat) during the review meeting. The peer-review of Ireland's report identified the following as representing good

practice: independence and competence of the Regulatory Body; good national emergency preparedness arrangements and, efforts to optimise the number of sources (thereby minimising the amount of radioactive waste) by discouraging licensees from holding onto redundant sources. The review identified the ongoing storage of the natural uranium fuel assembly rods; long term management of disused sealed sources which have no take-back arrangements; the storage of disused sources at separate locations throughout Ireland and, limited border post monitoring to prevent illicit movement of sources or waste as challenges facing Ireland. It was noted that Ireland has not yet developed a long-term waste management policy, an issue which has long been identified as a concern by the RPII.

### Oslo-Paris Convention

The 1992 OSPAR Convention for the Protection of the Marine Environment of the North East Atlantic requires signatory countries to take all possible steps to prevent and eliminate pollution of the marine environment by the year 2020. In 2009, in accordance with Ireland's obligations as a Contracting Party to the OSPAR Convention, the DEHLG, assisted by the RPII, started the process of reviewing and updating "Ireland's National Plan for the Implementation of the OSPAR Radioactive Substances Strategy".

Ireland's National Plan will be presented at the meeting of the ad-hoc working group on Radioactive Substances due to take place in 2010 and at the subsequent 2010 OSPAR Ministerial Commission Meeting. It will describe the progress made since the first plan was published in 2002 and will in particular:

- Review the implementation of the objectives which were set up in the 2002 plan;
- Provide information on discharge authorisations and technical improvements to reduce Irish discharges of radioactive substances to the marine environment;
- Provide forecasted discharges of radioactive substances to the year 2020; and
- Establish objectives for the next 5 to 10 years.

Progress noted since the first National Plan includes the adoption of a national position on the need for iodine holding-tanks at hospitals with iodine-ablation facilities, the undertaking of an assessment of iodine-131 discharges into the Dublin bay area and the completion of a peer review of the RPII's environmental monitoring programmes.

# Corporate Support Services

## Introduction

The Corporate Services Division provides services that support operations across the whole of the RPII. Corporate Services strives to ensure that conditions are created that promote efficiency and effectiveness and a positive organisational culture, as well as a strong governance and compliance infrastructure.

Notable achievements for the year are listed below under the various section headings.

## Communications

As a public body, communicating information to the public is at the core of RPII activities and ease of access to information about radiation protection and monitoring data is a strategic goal. To meet this objective, a range of communication activities was undertaken during the year including participation by the RPII at a wide range of events, seminars, conferences and meetings with other organisations.

The RPII is keen to cooperate with the media, who play a significant role in disseminating information and in reporting on radiological protection issues of public concern. Media interest continued during the year with staff participating in around 30 television and radio programmes at national and regional level. The coverage obtained was effective in raising public awareness of radiation protection issues, particularly in relation to radon gas.

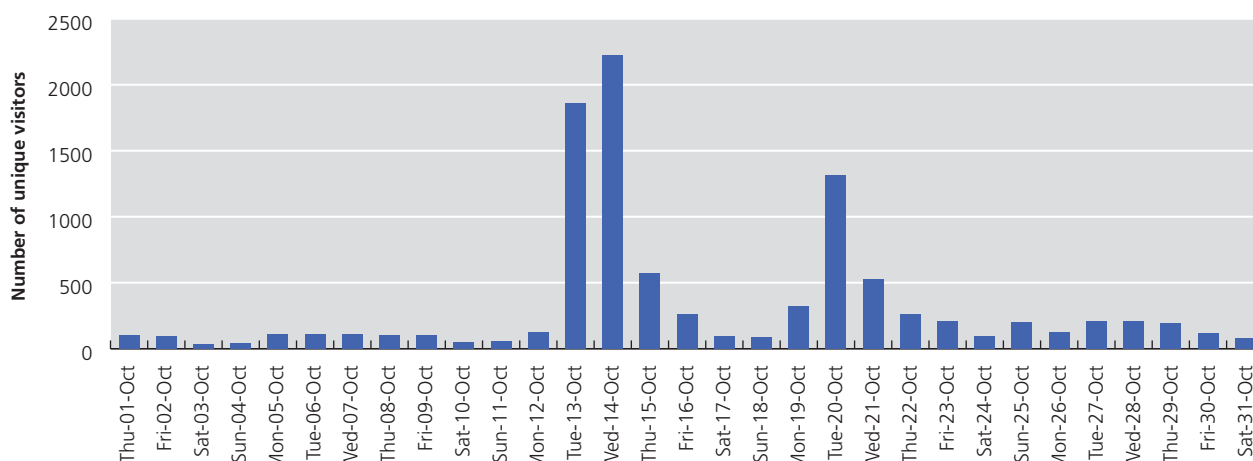
Staff engaged with stakeholders at a range of national and local events during the year, for example at conferences, seminars and exhibitions and including the BT Young Scientist Exhibition where the RPII sponsored a special award for the best project on ionising radiation. The winning entry was from Miss Noreen Lynch with her project on An Investigation into the Effectiveness of Radon Barriers.

In developing a website strategy for the RPII it was agreed that it would be the primary communications tool for the organisation. The website [www.rpii.ie](http://www.rpii.ie) was launched in May 2009 and it is the primary source of all information for the organisation. It is a useful resource for information on radiation protection and news and information about the RPII and its activities in a format that is readily accessible and it is updated and monitored on a daily basis. Features on the website include an interactive radon map where visitors can enter their home address to determine if they live in a High Radon Area, they can apply and pay online for a radon measurement, they can estimate their own radiation dose using the online dose calculator and they can see the RPII's monitoring network and access the results of the monitoring programme. Visitors can also keep up to date with developments in radiation protection by signing up to alerts which give notice of new publications, press releases and news.

The RPII's website has shown an approximate four-fold increase in visitor numbers since 2000 with nearly 43,000 unique visitors in 2009. With the redeveloped site came better statistics for recording visitor behaviour with visitors spending, on average, five minutes on each session on the site visiting approximately six pages. This indicates that the most visitors find what they expect and are engaged by the content. Approximately 53% of visitors came to the website via a search engine; 34% came directly to the website and 13% were referred from other sites. Popular areas of the redeveloped site include the radon map, information on radon, radon measurement, publications, the radiation dose calculator, licensing information, monitoring locations, news alerts, press releases, publications and emergency planning information.

Peaks in traffic to the website coincide with media activity; in particular over 10,000 unique visitors to the website were recorded in October on foot of a press release and appearance by a RPII staff member on national TV on the issue of radon in homes (Figure 9).

**Figure 9: Unique visitors to the RPII website during October 2009**



Internal communications continues to play a valuable role in RPII operations and in an effort to assess the effectiveness of current internal communication practices, a communications audit was carried out during the year. Recommendations from the audit will lead to the development and implementation of internal communications initiatives in 2010.

## Publications

Each year, the RPII produce a number of publications, including reports, guidance notes, codes of practice, information leaflets and posters – all of which are available free of charge on [www.rpii.ie](http://www.rpii.ie).

### Reports:

The Design of Diagnostic Medical Facilities where Ionising Radiation is used. (Blue Book).  
*RPII Report 09/01.*

### General Articles:

McGarry, A., (2009).  
Radiation in Ireland.  
*Public Affairs Ireland. January 2009, Issue No 54.*

Fenton, D., (2009).  
Radon Gas: Its properties, hazard and what is being done about it.  
*Environmental Health Officers Association Yearbook 2008-2009.*

### Guidance Notes:

Guidance Note on the Implementation of the Radiological Protection Act 1991 (Control of High Activity Sealed Radioactive Sources) Order 2005 (S.I. No. 875 of 2005).

Guidance Notes to Local Authorities on Implementing a Radon Measurement Programme.

Guidelines for Reporting Radiological Incidents to the Radiological Protection Institute of Ireland.

Guidelines on the protection of the unborn child during diagnostic medical exposures.

### Scientific Journals:

Keogh, S.M., Aldahan, A., Possnert, G., Vintró, L.L., Mitchell, P.I., Smith, K.J. \*, McGinnity, P\*. (2009).  
Anthropogenic <sup>129</sup>I in precipitation and surface waters in Ireland.  
*Nucl. Instr. and Meth. in Phys. Res. B. Volume 268, Issues 7-8, April 2010, p. 1232-1235.*

\* RPII staff in conjunction with other authors.

## Partnership

Workplace partnership continued in the RPII during 2009 with the Partnership Committee meeting on nine occasions. The aim of Partnership is to improve the work environment, productivity and excellence of service within the RPII by providing a forum for sharing information, consultation and problem solving. The Partnership Committee aims to achieve joint ownership, by Management, staff and Trade Union of the process of change. All parties have the opportunity to influence the way things are done in the RPII.

The issues dealt with by partnership arise from matters raised by staff, requests from various divisions within the RPII and from members of the committee itself. The issues dealt with during 2009 included:

- The updating and improvement of the PMDS system;
- A code of conduct for office working;
- Flu pandemic planning;
- Good faith reporting policy;
- Internal communications audit;
- European mobility week;
- Team building;
- Review of recruitment and promotions policy;

In addition, 2009 also saw the nomination of new partnership representatives and joint-chairs on the partnership committee whose term will run until 2011. The effectiveness of the Partnership Committee in facilitating internal communications was highlighted in the internal communications audit conducted in 2009.

## Finance

The RPII's Annual Accounts and financial Statements are presented in detail on page 43.

### RPII Income

The RPII's income in 2009 was €7.185m made up of a grant of €3.865m for current purposes, a grant receivable of €1.039m for pension purposes as required under FRS 17, and earnings of €1.628m from licence charges and dosimetry, product certification, radon measurement and other services. €0.652m of capital grant was amortised in the year.

The RPII also received a capital grant of €0.380m for the upgrading and maintenance of its equipment. Income for the year exceeded expenditure by €0.149m.

## Financial Services

Following its introduction in late 2008 work continued to implement the new arrangements for financial management. The newly centralised accounts function is now supported by a modern software system to manage all financial transactions across the organisation.

## Prompt Payments of Accounts

The RPII comes under the remit of the Prompt Payment of Accounts Act, 1997, which came into effect on 2nd January, 1998, and the European Communities (Late Payment in Commercial Transactions) Regulations 2002 which came into effect on 7th August 2002. The following is a report on the payment practices of the RPII for the year ended 31st December 2009.

It is the policy of the RPII to ensure that all invoices are paid promptly. The organisation's system of internal control includes accounting and computer controls to ensure the identification of invoices and contracts for payment within the prescribed timeframe of the Act. The accounts department produces a report that identifies unpaid outstanding invoices and this report is reviewed regularly.

Approximately 99.22% of all payment demands during 2009 was made within the prescribed timeframe. There were four late payments with a value in excess of €317 and these exceeded the due payment date by an average of 19 days. The total value of these late payments was €12,417 and the penalty interest payments associated with these late payments amounted to €41.95. The late payments represented .78% of total supplier payments to suppliers in 2009.

## Advisors and Consultants

In 2009 the RPII enlisted the services of a number of experts and advisors. Table 4 lists the main contracts and the nature of the services provided.

**Table 4: RPII Advisors and Consultants 2009**

Consultant	Nature of work undertaken
Astron Consulting	Review of telephony systems and practices
CEFAS	Peer review of monitoring programmes
First Impression	Publications design and printing
Genesis	Review of commercial activities
Health Protection Agency (UK)	Peer Review of radiotherapy licensing and inspection systems
Prof Pat Horton	RPA assessments and Inspections
Labware	Peer review of monitoring programmes
Mr FK Ledgerwood	Peer review of monitoring programmes
Dr JP McLaughlin	Thoron project
Merc Partners	Enhancement of the Performance Management System
Metrology Systems & Services	Preparation for INAB accreditation
Prof Peter Mitchell	Peer review of monitoring programmes
Mooney O'Sullivan Solicitors	Legal advice
Murray Consultants	Communications advice; Internal communications audit
Norton & Associates	Accountancy
RISO	Peer review of monitoring programmes
Royal Surrey County Hospital	Analysis of complex radiotherapy licensing applications
University College Dublin School of Mathematics	Statistical services
X-Communications	Web design and development

## Human Resources

### Human Resources & Staffing

The moratorium on recruitment and promotion and the incentivised early retirement scheme announced in early 2009 resulted in the loss during 2009 of 5 posts. This impact significantly undermined many of the improvements in staff structures made during 2008. Since early 2009 the RPII has been in negotiation with the DEHLG to make a case for the replacement of lost posts. In the meantime the RPII has maintained as full a service to its customers as is achievable under the circumstances.

During the year, a new performance management and development system (PMDS) was developed for the RPII. This system will streamline the PMDS process thereby allowing more effort to be focussed on performance discussions. This measure, together with a managers' development programme commenced in 2009, aims to enhance RPII performance overall though consistency of management and clarity of expectations for all RPII staff.

### **Non-ionising Radiation**

In March 2007, on foot of a Memorandum to Government tabled by the then Minister for Communications, Marine and Natural Resources, the Government agreed that the RPII's mandate and resources should be extended to include aspects of non-ionising radiation. Since 2008, progress towards the handover of responsibilities to the RPII has slowed and a commencement date is not currently available.

### **Health and Safety**

The RPII operates a Safety Management System that encourages continuous improvement through the setting of annual performance goals. In setting the goals for 2009, the Safety Committee focussed on personal health and safety including eye health, stress management, workstation safety and workplace security.

There were no "reportable accidents" or dangerous occurrences in 2009.

### **Equality**

The RPII is committed to a policy of equal opportunity. This is reflected in relation to staff in terms of equality in recruitment, conditions of employment and access to promotion, training and career development. The RPII also supports flexible working arrangements as they are vital to making the workplace accessible to people juggling work and other commitments. In relation to the customer, the RPII worked towards enabling all customers to obtain equal access to our services. In 2009, a redeveloped website was established as the primary communications tool for customers. In the redevelopment of the website the RPII ensured that it was designed and usability tested with accessibility in mind.

### **Accommodation**

In 2009, the RPII undertook actions to improve the security of its premises. A dual verification system was introduced to provide staff with secure access to buildings. Electronic access systems were also installed internally to control access to sensitive areas including data sensitive areas. Improvements were also made to alarm systems and physical perimeter security.

A new domestic waste management system was introduced in 2009. The result of this was a significant rise in the volumes of waste being recycled and a 50% reduction of waste management costs.

## **Information Management**

### **Information Communications Technology (ICT)**

ICT disaster recovery systems were a key area of action in 2009 with the introduction of a real time backup solution for critical servers. The result will mean faster recovery with minimal data loss. Recovery can be performed by ICT staff working locally or from a remote location.

In 2009, the RPII acquired additional space in a separate building. A second server room was installed which allowed for improvements in disaster recovery. Nightly backups and critical server replications are performed to this location allowing for recovery in the event of fire.

Within the RPII, ICT related projects are project managed by the IT section. In 2009, it successfully managed the new website development project and a project to provide additional electronically based-services for Dosimetry customers.

In 2009, the RPII installed its first virtual server. The e-mail server was upgraded and transferred to this new platform. In 2010, the virtual environment will be considered to assess the advantages in relation to cost and energy savings as well as disaster recovery.

### **Quality Customer Services (QCS)**

The current QCS Action Plan spans the period 2008-2010. The aim of this plan is to improve quality in the services provided. In 2009, the QCS working group carried out an interim review of progress. While progress had been noted in most areas, one significant highlight was the launch of a new customer focused website. This website provides information in a more customer focused way as well as improved access to services.

The QCS working group commenced development of an internal procedure for managing complaints. This procedure aims to ensure that all complaints are managed in a consistent manner and that appropriate corrective action is taken. This procedure is expected to be launched in 2010 and training will be provided to staff. The QCS working group will take on responsibility for the monitoring of any complaints.



# Our Governance

## Corporate Governance

The revised Code of Practice for the Governance of State Bodies published by the Dept of Finance in 2009 introduced some additional governance requirements for all commercial and non-commercial state bodies, including the RPII. During the year, the RPII Corporate Governance Manual was updated to reflect these new requirements. This included the development of a charter for internal audit, a whistle blower policy, revision of the schedule of matters reserved for the Board and Audit Committee, and revision of travel procedures,

In January and April training sessions were delivered for all newly appointed Board members and for the Audit Committee members, to apprise them of the work of the RPII and of the governance requirements associated with Board and Audit Committee membership.

The RPII has an Audit Committee which is a sub-committee of the Board, to advise on finance, governance and organizational risk. In addition, the Communications Advisory Committee provides advice relating to the RPII's role in communication with the public.

Historically, the RPII has had two scientific advisory committees established to bring broader external perspectives to the work of the RPII. These committees have been in place over many years and are the Environmental Radiation Advisory Committee and the Medical Radiation Advisory Committee. The membership of these committees is set out on page 42. During 2009, the work of these committees was reviewed and the decision was taken to replace them with a single advisory group – the Ionising Radiation Advisory Committee (IRAC). The terms of reference of the IRAC were approved by the Board in 2009 with a view to a first meeting in 2010. Details of the membership of this group is set out on page 42.

In addition to these established committees the Board, from time to time, establishes subcommittees to address specific issues. During 2009, a subcommittee was established to review the RPII role in commercial services and its strategic alignment. Details of the work of this subcommittee can be found in the section Radiation Measurement Services.



# Members of the Board

The Board met eight times during the year. The number of meetings attended by each Board member is shown below, the number in brackets indicating the number of meetings the member in question was eligible to attend. Also shown, in the case of the six members who were nominated for appointment to the Board by particular organisations, is the name of the respective nominating organisations.

## Chairman

**Professor Eugene Kennedy** 8 (8)

**Ms Nuala Ahern** 7 (8)

**Ms Fionnuala Barker** 6 (8)

*Irish Nuclear Medicine Association*

**Dr Éamann Breatnach**

*Medical Council* 7 (8)

**Dr Maurice Fitzgerald** 4 (8)

*Dental Council*

**Mr James Fitzmaurice** 8 (8)

**Dr Kevin Kelleher**

*Health Service Executive* 7 (8)

**Mr Patrick Gilligan**

*Association of Physical Scientists in Medicine* 5 (5)

**Dr Niall McEniff**

*Faculty of Radiologists,  
Royal College of Surgeons Ireland* 4 (8)

**Ms Darina Muckian** 5 (5)

**Mr John O'Dea** 0 (0)

**Ms Adi Roche** 5 (5)

**Mr Francis J Turvey** 5 (5)

The total figure for Board remuneration and expenses in 2009 was €101,075.



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## 1 Professor Eugene Kennedy (Chairman)

Professor Kennedy was appointed Board Chairman in 2006. He has been Professor of Physics at Dublin City University (DCU) for more than 20 years, and is currently Vice-President for Research.

Well-known internationally for his research in atomic and plasma physics, his work has been published widely. Elected a Fellow of the Institute of Physics in 1987, and a member of the Royal Irish Academy in 2004, Professor Kennedy has served on many national and international boards.

## 2 Ms Nuala Ahern

Ms Nuala Ahern was appointed to the Board in 2008. Ms Ahern is an environmental policy analyst and writer on ecology and psychology. She is a former member of the European Parliament (Green Party) and represented Leinster for 10 years from 1994-2004. Ms Ahern was a member of the European Parliament's Committee on Trade and Industry, Energy and Research for ten years and vice president of that committee from 1999-2004.

## 3 Ms Fionnuala Barker

Ms Fionnuala Barker was appointed to the Board in 2007. As Principal Physicist in St Luke's Hospital Dublin, she has extensive expertise in the field of medical physics, notably in nuclear medicine and radiation protection. Ms Barker is a past Secretary of the Irish Nuclear Medicine Association, and a past Chair of the Association of Physical Scientists in Medicine.



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#### 4 **Dr Éamann Breatnach**

Dr Éamon Breatnach was appointed to the Board on 7 November 2008. Dr Breatnach is a Consultant Radiologist at the Mater Hospital and past Dean of the Faculty of Radiologists, Royal College of Surgeons in Ireland. He is Chairman of the Education Committee of the European Society of Radiology and a member of the Society's governing executive.

#### 5 **Mr James Fitzmaurice**

Mr James Fitzmaurice was appointed to the Board in 2002. Mr Fitzmaurice is Chairman of the RPII's Communications Advisory Committee. He is the Managing Director of the Bradan Group, which publishes the Public Sector Times and various local newspapers. Positions he has previously held include Chairman of the ISME; President of Bray Chamber of Commerce; and Chairman of the Irish e-Government Awards and Centres of Excellence. He has served on many small business task forces and committees and is currently a member of the Wicklow County Council's Strategic Policy Committee on Environment and Waste.

#### 6 **Mr Patrick Gilligan**

Mr Patrick Gilligan was appointed to the Board in 2006. Mr Gilligan is a Principal Physicist providing radiation protection services and medical physics expertise to the Mater Private Hospital. He is a past Chairman of the Association of Physical Sciences in Medicine and is a member of the Medical Council's Medical Ionising Radiation Committee.

#### 7 **Dr Niall McEniff**

Dr Niall McEniff was appointed to the Board in 2007. Dr McEniff is a Consultant Radiologist in St James's Hospital, Dublin. He is a fellow of the Faculty of Radiologists in the Royal College of Surgeons of Ireland.

#### 8 **Ms Darina Muckian**

Ms Darina Muckian was appointed to the Board in 1997. Ms Muckian is a Physics graduate with more than ten years engineering experience in electronics and software industries and has campaigned on environmental issues.

#### 9 **Ms Adi Roche**

Ms Adi Roche was appointed to the Board in 1997. Ms Roche is the Founder and CEO of Chernobyl Children International (CCI), an international organisation with United Nations NGO status, providing medical and humanitarian programmes to children and families across the Chernobyl regions. The organisation's main programme areas include Medical Care Programmes (Child Cardiac Surgeries; Nursing Programmes & Life-Saving Operations; Hospice & Community Care Programmes); De-institutionalisation Programme, Building & Construction Programme and Rest & Recuperation.

#### 10 **Mr Francis J. Turvey**

Mr Francis J. Turvey was appointed to the Board in 2001. Mr Turvey is a former assistant Chief Executive Officer of the RPII. Since retirement, he has worked as a consulting engineer in the fields of radiological protection and nuclear safety.

He is a Chartered Engineer and Fellow of several professional organisations, including the Irish Academy of Engineering; the Institution of Engineers of Ireland; the Institute of Nuclear Engineers; and the Institute of Physics. He also holds a UK Board of Trade Certificate of Service as First Class Engineer in the Merchant Navy.

#### **Dr Maurice Fitzgerald** (*not pictured*)

Dr Maurice FitzGerald was appointed to the Board on 11 July 2008. Dr FitzGerald qualified from UCC in 1989 and works as a general dental practitioner in Sligo. He received an MSc in Dental Radiology in 2000 from the University of London and serves on the board of the RPII as the nominee of the Dental Council, of which he is an elected member.

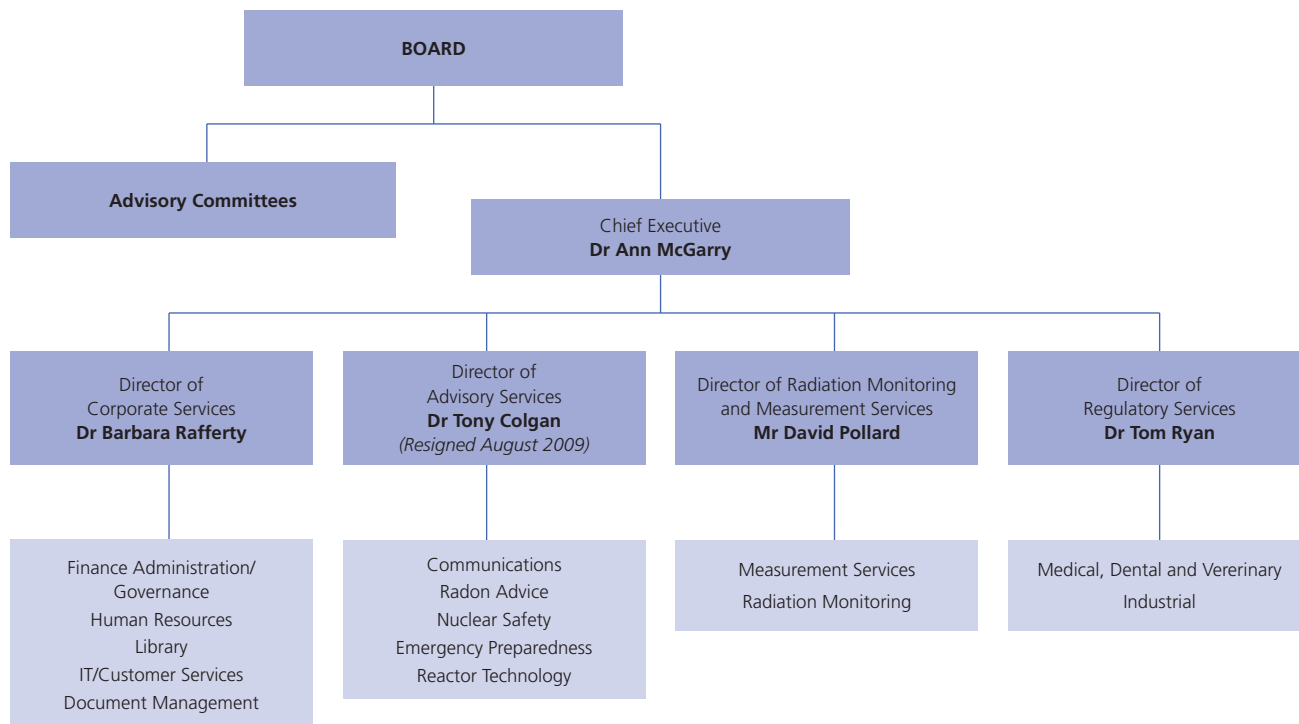
#### **Dr Kevin Kelleher** (*not pictured*)

Dr Kevin Kelleher was appointed to the Board in 2007. Dr Kelleher is Assistant National Director Population Health – Health Protection, managing the public health services for the HSE. He has a strong interest in environmental impacts on human health.

#### **Mr John O'Dea** (*not pictured*)

Mr John O'Dea was appointed to the Board in 2009. Mr O'Dea is a lecturer of Environmental Physics in IT Sligo and has published in the area of radiation both academically and for the general public. He has a long involvement in social and cultural activities including a period as Chairperson of Sligo Campaign for Nuclear Disarmament (CND).

## Staff Structure



**Dr Ann McGarry**  
Chief Executive

**Mr David Pollard**  
Director of Radiation  
Monitoring and  
Measurement Services

**Dr Barbara Rafferty**  
Director of  
Corporate Services

**Dr Tony Colgan**  
Director of Advisory Services

**Dr Tom Ryan**  
Director of  
Regulatory Services

## The RPII Team of 2009

Alison McIntyre	Ann McGarry	Ashley Curran
Barbara Rafferty	Catherine McCarron	Catherine Organo
Catherine Scully	Christopher Hone	Ciara Maguire
Ciara McMahon	David Dawson	David Fenton
David Pollard	David Spain	Dermot Howett
Eileen Hayden	Emily Clarke	Glenda Griffin
Heather Rochford	Hugh Synnott	Isabella Bolger
Jack Madden	Jarlath Duffy	Jennie Wong
Kevin Kelleher	Kilian Smith	Leo McKittrick
Linda Coyne	Lisa Barron	Lorraine Currivan
Lucy Doody	Máirín O'Colmáin	Mary Fegan
Michael Murray	Noeleen Cunningham	Olivia Cluskey
Olwyn Hanley	Pamela Lennon	Paul Fitzgerald
Paul McGinnity	Rachael Flynn	Roisin McNamee
Rose Timmons	Sarah Baker	Sharon Wade
Sheila Powell	Stephanie Long	Stephen Fennell
Stephen Somerville	Tanya Kenny	Teresa Grant
Tom Ryan	Tony Colgan	Veronica Smith

## Advisory Committees

### Audit Committee

**This Committee advises the Board on finance, governance and organisational risk**

<i>Chairman</i> Mr Patrick Gilligan	Mr James Fitzmaurice
Ms Darina Muckian	Professor Ciaran O hOgartaigh



## Advisory Committees (continued)

### Medical Radiation Advisory Committee

**This Committee advises the Board on the uses of ionising radiation in medicine and dentistry.**

*Chairman* Dr George Duffy

Ms Fionnuala Barker

Dr David Clarke

Ms Susan Dennen

Dr Stephen Fennell

Mr Christopher Hone

Dr Pat Kenny

Dr Brendan McClean

Dr Ann McGarry

Dr Lesley Malone

Dr Geraldine O'Reilly

Dr Tom Ryan

Dr Stephen Skehan

Prof Wil van der Putten

*Scientific Secretary* Ms Noeleen Cunningham

### Communications Advisory Committee

**This Committee provides advice relating to communication with the public.**

*Chairman* Mr James Fitzmaurice

Ms Fionnuala Barker

Dr Tony Colgan (*Retired 2009*)

Ms Marie Kelly

Dr Ann McGarry

Dr Barbara Rafferty (*Appointed 2009*)

### Ionising Radiation Advisory Committee

This Committee acts as a high level scientific advisory body on any matter concerning ionising radiation, with particular emphasis on public health matters, referred to it by the Board or by the Executive of the RPII. With effect from January 2010 this Committee will replace the Environmental Radiation and the Medical Radiation Advisory Committees.

*Chairman* Dr Eamann Breatnach

Dr Nuala Ahern

Dr Michael Casey

Dr Harry Comber

Dr Dominique Crowley

Mr Sean Hogan

Dr Jean Luc-Godet

Prof Ian McAulay

Prof Brendan McClean

Dr Jim McLaughlin

Dr Jill Meara

Prof Peter I Mitchell

Dr Neil O'Donovan

Dr Geraldine O'Reilly

Dr Jane Renehan

Prof Wil van der Putten

*Scientific Secretary* Ms Stephanie Long

# Financial Statements

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# Report of the Comptroller and Auditor General

*for presentation to the Houses of the Oireachtas*

I have audited the financial statements of the Radiological Protection Institute of Ireland for the year ended 31st December 2009 under the Radiological Protection Act, 1991.

The financial statements, which have been prepared under the accounting policies set out therein, comprise the Statement of Accounting Policies, the Income and Expenditure Account, the Statement of Total Recognised Gains and Losses, the Balance Sheet and the related notes.

## Respective Responsibilities of the Institute and the Comptroller and Auditor General

The Institute is responsible for preparing the financial statements in accordance with the Radiological Protection Act, 1991, and for ensuring the regularity of transactions. The Institute prepares the financial statements in accordance with Generally Accepted Accounting Practice in Ireland. The accounting responsibilities of the Members of the Institute are set out in the Statement of Responsibilities of the Institute.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

I report my opinion as to whether the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland. I also report whether in my opinion proper books of account have been kept. In addition, I state whether the financial statements are in agreement with the books of account.

I report any material instance where moneys have not been applied for the purposes intended or where the transactions do not conform to the authorities governing them.

I also report if I have not obtained all the information and explanations necessary for the purposes of my audit.

I review whether the Statement on Internal Financial Control reflects the Institute's compliance with the Code of Practice for the Governance of State Bodies and report any material instance where it does not do so, or if the statement is misleading or inconsistent with other information of which I am aware from my audit of the financial statements. I am not required to consider whether the Statement on Internal Financial Control covers all financial risks and controls, or to form an opinion on the effectiveness of the risk and control procedures.

I read other information contained in the Annual Report, and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements.

## Basis of Audit Opinion

In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures and regularity of the financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgements made in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Institute's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

## Opinion

In my opinion, the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland, of the state of the Institute's affairs at 31st December 2009 and of its income and expenditure for the year then ended.

In my opinion, proper books of account have been kept by the Institute. The financial statements are in agreement with books of account.



**Andrew Harkness**

*for and on behalf of the Comptroller and Auditor General*

21st September 2010

# Statement on Internal and Financial Controls

On behalf of the Board of the Radiological Protection Institute of Ireland, I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or would be detected in a timely period.

## Key Control Procedures

The Board has taken steps to ensure an appropriate control environment by

- clearly defining management responsibilities;
- establishing formal procedures for reporting significant control failures and ensuring appropriate corrective action.

The Board established formal processes to identify and evaluate business risks by

- identifying the nature, extent and financial implications of risks facing the body including the extent and categories which it regards as acceptable;
- assessing the likelihood of identified risks occurring;
- assessing the body's ability to manage and mitigate the risks that do occur.

The system of internal financial control is based on a framework of regular management information, administrative procedures including segregation of duties, and a system of delegation and accountability. In particular it includes:

- a comprehensive budgeting system with an annual budget which is reviewed and agreed by the Board;
- regular reviews by the Board of bi-monthly management accounts and annual financial reports which indicate financial performance against forecasts;
- clearly defined capital investment control guidelines.

The Board's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the Audit Committee which oversees the work of the internal auditor, the executive managers within the Radiological Protection Institute of Ireland who have responsibility for the development and maintenance of the financial control framework, and comments made by the Comptroller and Auditor General in his management letter or other reports.

The Radiological Protection Institute of Ireland established an internal audit function which operates in accordance with the Framework Code of Best Practice set out in the Code of Practice for the Governance of State Bodies. The work of internal audit is informed by analysis of the risk to which the body is exposed, and annual internal audit plans are based on this analysis. The analysis of risk and the internal audit plans are endorsed by the Audit Committee and approved by the Board. The Board is provided with an annual report of internal audit activity by the Internal Auditor. The report includes the Internal Auditor's opinion on the adequacy and effectiveness of the system of internal financial control.

## Annual Review of Controls

I confirm that in the year ended 31 December 2009 the Board conducted a review of the effectiveness of the system of internal financial controls.

Signed on behalf of the Board



**Prof Eugene Kennedy**  
Chairman

13th September 2010

# Statement of Responsibilities of the Institute

Section 16 (1) of the Radiological Protection Act, 1991, requires the Institute to prepare financial statements in such form as may be approved by the Minister for the Environment, Heritage and Local Government with the concurrence of the Minister for Finance. In preparing these financial statements, the Institute is required to:

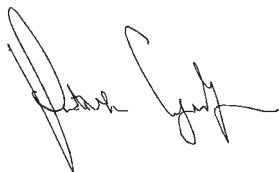
- Select suitable accounting policies and then apply them consistently
- Make judgements and estimates that are reasonable and prudent
- Prepare financial statements on the going concern basis unless it is inappropriate to presume that the Institute will continue in operation
- State whether applicable accounting standards have been followed, subject to any material departures disclosed and explained in the financial statements.

The Board confirm that they have complied with the above requirements in preparing the financial statements. The Institute is responsible for keeping proper books of accounts which disclose with reasonable accuracy at any time the financial position of the Institute and which enable it to ensure that the financial statements comply with Section 16 (1) of the Act. The Institute is also responsible for safeguarding the assets of the Radiological Protection Institute of Ireland and for taking reasonable steps for the prevention and detection of fraud and other irregularities.



**Prof Eugene Kennedy**

*Chairman*



**Patrick Gilligan**

*Board Member*



# Statement of Accounting Policies

## 1. Basis of Accounting

The Financial Statements are prepared on an accruals basis, except as stated below, and under the historical cost convention, in accordance with generally accepted practice. Financial reporting standards recommended by the recognised accountancy bodies are adopted as they become applicable. The unit of currency in which the financial statements are denominated is the Euro.

The Financial Statements are in the format approved by the Minister for the Environment, Heritage and Local Government with the consent of the Minister for Finance.

## 2. Income

Income shown in the Financial Statements under Oireachtas grants represent actual cash receipts in the year.

## 3. Fixed Assets

Fixed Assets are stated at cost less accumulated depreciation. Cost includes the estimated cost of disposal of radioactive sources. Depreciation is calculated on a straight line basis by reference to the expected useful lives of the assets concerned. The rates are used as follows:

- Office & Laboratory Furniture & Equipment: 20%
- Leasehold Improvements are depreciated over the life of the lease.

## 4. Superannuation

The Radiological Protection Institute of Ireland operates a defined benefit pension scheme which is funded annually on a 'pay-as-you-go' basis from monies provided by the Minister for the Environment, Heritage and Local Government and from contributions deducted from staff salaries.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are retained by the Institute. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Total Recognised Gains and Losses and a corresponding adjustment is recognised in the amount recoverable from the Department of the Environment, Heritage and Local Government.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of the Environment, Heritage and Local Government.

## 5. Capital Account

The Capital Account represents the unamortised amount of income used to purchase fixed assets.

## 6. Income in Advance

Income in advance relates to licence fee income paid in advance by licensees in respect of future periods.

# Income and Expenditure Account

for the year ended 31st December 2009

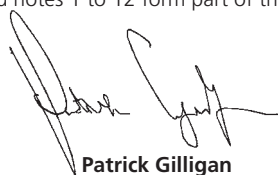
2008 €		2009 €
	<b>INCOME</b>	
4,676,000	Oireachtas Grant	4,245,000
1,147,666	Net Deferred Funding for Pensions (Note 7b)	1,039,310
(183,135)	Transfer from/(to) Capital Account (Note 2)	272,441
5,640,531		5,556,751
635,937	Dosimetry & Calibration Service	573,300
154,969	Radon Measurement Service	160,590
295,672	Radiation Monitoring Service	283,979
261,716	Regulatory Service	598,418
20,302	Miscellaneous/Contract Income	12,137
1,368,595		1,628,424
7,009,126		7,185,175
	<b>EXPENDITURE</b>	
3,221,717	Salaries (Note 3)	3,284,383
1,398,173	Pension (Note 7c)	1,340,432
99,115	Dosimetry & Calibration Service	123,138
51,205	Radon Measurement Service	32,958
176,146	Radiation Monitoring Service	147,564
89,185	Regulatory Service	77,887
155,716	Public Information & Communications	146,334
81,881	Nuclear Safety	75,579
151,471	Library & Document Management	107,965
568,953	Accommodation & Insurance	587,429
159,479	Travel & Subsistence	130,010
95,734	Recruitment & Training	97,263
61,043	MIS, IT & Customer Service	64,277
83,068	Postage, Phone & Office Supplies	71,441
12,250	Audit Fees	11,515
58,252	Professional Fees & Miscellaneous	59,900
616,865	Depreciation	652,441
-	Loss on Disposal of Fixed Assets	25,000
7,080,253		7,035,516
(71,127)	<b>SURPLUS/ (DEFICIT) FOR YEAR</b>	149,659
680,765	Balance as at 1st January	609,638
609,638	Balance as at 31st December	759,297

The Statement of Accounting Policies and notes 1 to 12 form part of these Financial Statements



**Prof Eugene Kennedy**

Chairman



**Patrick Gilligan**

Board Member

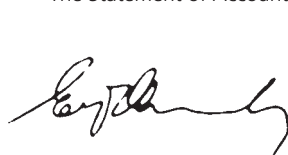
13 September 2010

# Statement of Total Recognised Gains and Losses

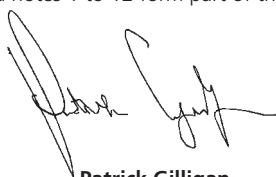
for the year ended 31st December 2009

2008 €		Notes	2009 €
(71,127)	Surplus/(Deficit) for year		149,659
(430,000)	Experience/Gains on pension scheme liabilities		(266,000)
1,398,000	Change in assumptions underlying the present value of pension scheme liabilities		(442,000)
968,000	Actuarial (Loss)/on Pension Liabilities	7f	(708,000)
(968,000)	Adjustments to Deferred Pension Funding		708,000
(71,127)	Total recognised gain/(loss) for the year		149,659

The Statement of Accounting Policies and notes 1 to 12 form part of these Financial Statements



**Prof Eugene Kennedy**  
Chairman



**Patrick Gilligan**  
Board Member

13 September 2010

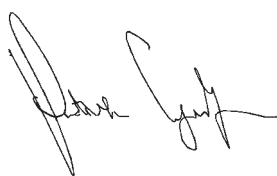
# Balance Sheet

as at 31st December 2009

2008 €		Notes	2009 €
2,021,883	<b>FIXED ASSETS</b>	1	1,721,158
	<b>CURRENT ASSETS</b>		
1,123,993	Cash on Hand & at Bank		1,472,563
291,700	Debtors	8	304,112
1,415,692			1,776,675
	<b>CREDITORS – amounts falling due within one year</b>		
428,090	Creditors	9	353,494
3,850	Capital Grant in Advance	10	32,134
0	Provision for Disposal of Radioactive Waste	11	43,400
374,114	Income in Advance		588,350
806,055			1,017,378
609,638	<b>NET CURRENT ASSETS</b>		759,297
2,631,521	<b>TOTAL ASSETS LESS CURRENT LIABILITIES</b>		2,480,455
17,191,147	Deferred Pension Funding	7d	18,938,457
(17,191,147)	Pension Liability	7e	(18,938,457)
2,631,521	<b>NET ASSETS</b>		2,480,455
	<b>Financed by:</b>		
609,638	Income and Expenditure Account		759,297
2,021,883	Capital Account	2	1,721,158
2,631,521			2,480,455



**Prof Eugene Kennedy**  
Chairman



**Patrick Gilligan**  
Board Member

13 September 2010

# Notes to the Financial Statements

for the year ended 31st December 2009

## 1. FIXED ASSETS

	Leasehold Improvements €	Office and Laboratory Furniture and Equipment €	Total €
<b>Cost:</b>			
At 1st January 2009	788,301	6,787,917	7,576,218
Additions	0	351,716	351,716
Disposals	0	(17,105)	(17,105)
At 31st December 2009	788,301	7,122,528	7,910,829
<b>Depreciation:</b>			
At 1st January 2009	532,165	5,022,170	5,554,335
Charge for year	25,617	626,824	652,441
On disposals	0	(17,105)	(17,105)
At 31st December 2009	557,782	5,631,889	6,189,671
<b>Net Book Value at</b>			
31st December 2009	230,519	1,490,639	1,721,158
<b>Net Book Value at</b>			
31st December 2008	256,138	1,765,747	2,021,883

## 2. CAPITAL ACCOUNT

	2009 €	2009 €	2008 €	2008 €
Balance at 1st January 2009		2,021,883		1,610,625
Capital Grant Received	380,000		800,000	
Less Grant Amortised in the Year	(652,441)		(616,865)	
Transfer from/(to) Income & Expenditure Account		(272,441)		183,135
Transfer (to)/from Capital Grant in Advance		(28,284)		228,123
Balance at 31st December 2009		1,721,158		2,021,883



# Notes to the Financial Statements (continued)

for the year ended 31st December 2009

## 3. SALARIES AND PENSIONS

	2009 €	2008 €
Gross Salaries	3,135,188	3,079,559
Employers P.R.S.I.	149,195	142,158
	3,284,383	3,221,717

The CEO received salary payments of €158,644 in 2009. No bonus payments were made to the CEO. The CEO received recoupment of travel and subsistence expenses of €9,367 in 2009. The CEO is a member of an unfunded defined benefit public sector scheme and her pension entitlements do not extend beyond the standard entitlements in the public sector defined benefit superannuation scheme.

€162,102 was deducted from staff by way of pension levy and was paid over to the Minister for the Environment.

The average number of full-time persons employed, excluding Board members, in the financial year was 52 (2008-46).

## 4. COMMITMENTS & LEASE OBLIGATIONS – Operating Leases

### 3 Clonskeagh Square

Lease commitments payable in the next twelve months amount to €300,000 on the basis of current rental rates and comprise rental payments on a leasehold interest, the term of which expires on 1st October 2018. The rental is subject to review at five-yearly intervals. The last such review was 1st October 2009.

### 1 Clonskeagh Square

Lease commitments payable in the next twelve months amount to €140,000 on the basis of current rental rates, and comprise rental payments on a 20 year leasehold interest commencing on 25th January 2008, with a break clause on 1st October 2018. The rent is subject to review at five-yearly intervals.

## 5. CAPITAL COMMITMENTS

The value of capital commitments authorised at 31st December 2009 amounted to €0.

## 6. BOARD MEMBERS' INTERESTS

The Board adopted procedures in accordance with guidelines issued by the Department of Finance in relation to the disclosure of interests by Board members and these procedures have been adhered to in the year. There were no transactions of any significance in the year in relation to the Institute's activities in which the Board members had any beneficial interest. A breakdown of Board member's fees paid during 2009 is as follows:

	€		€
Professor E Kennedy (Chairman)	13063	Dr E Breatnach	9750
Dr N McEniff	8400	Mr F J Turvey	5186
Ms F Barker	8400	Ms D Muckian	5251
Ms N Ahern	8400	Ms A Roche	5251
Mr M Fitzgerald	8400	Mr P Gilligan	5251
Mr J Fitzmaurice	8400		

Travel and subsistence expenses paid during 2009 amounted to €15,323.

## 7. PENSIONS

### (a) Pension Scheme

The disclosures below have been prepared for the Radiological Protection Institute of Ireland (RPII) in relation to benefits payable from the Radiological Protection Institute of Ireland Superannuation Scheme ("the Scheme").

The Scheme is a defined benefit type, providing retirement benefits based on final salary, in accordance with the Public Sector model rules. The Scheme is funded annually on a pay as you go basis from monies provided by the Minister for the Environment, Heritage and Local Government and from contributions deducted from staff salaries.

The valuation used for FRS17 disclosures has been based on a full assessment of the liabilities of the Scheme as at 31st December 2009. The present values of the defined benefit obligation, the related service costs and any past service costs were measured using the projected unit credit method.

The principal assumptions used by independent qualified actuaries to calculate the liabilities under FRS17 are set out below:

	At year-end 31/12/2009	At year-end 31/12/2008	At year-end 31/12/2007
<i>Rate of increase in pensionable salaries</i>			
Discount rate	5.50%	5.60%	5.50%
Inflation assumption	2.25%	2.00%	2.50%
Rate of increase in pensionable salaries	3.50%	3.50%	4.00%
Rate of increase of pensions in payment	3.50%	3.50%	4.00%

### (b) Net Deferred Funding for Pensions in Year

	Year to 31/12/2009 €'000s	Year to 31/12/2008 €'000s	Year to 31/12/2007 €'000s
Funding Recoverable in respect of Current Year			
Pension Costs	1,548	1,598	1,604
State Grant Applied to Pay Pensions	(509)	(450)	(188)
	1,039	1,148	1,416

### (c) Analysis of Total Pension Costs

	Year to 31/12/2009 €'000s	Year to 31/12/2008 €'000s	Year to 31/12/2007 €'000s
Current Service Cost	583	668	763
Interest Cost	965	930	841
Employee Contributions	(208)	(200)	(193)
Net return	1,340	1,398	1,411

### (d) Deferred Funding Asset for Pensions

The RPII recognises amounts owing from the State for the unfunded deferred liability for pensions on the basis of a number of past events. These events include the statutory backing for the superannuation scheme, and the policy and practice in relation to funding public service pensions including the annual estimates process. While there is no formal agreement and therefore no guarantee regarding these specific amounts with the Department of Environment, Heritage and Local Government, the RPII has no evidence that this funding policy will not continue to progressively meet this amount in accordance with current practice. The deferred funding asset for pensions as at 31st December 2009 amount to €18.938 million (2008:€17.191 million).

# Notes to the Financial Statements (continued)

for the year ended 31st December 2009

## 7. PENSIONS (continued)

### (e) Movement in Net Pension Liability During the Financial Year

	Year to 31/12/2009 €'000s	Year to 31/12/2008 €'000s	Year to 31/12/2007 €'000s
Net Pension Liability at 1st January	17,191	16,812	17,601
Current Service Cost	583	668	763
Interest Cost	965	930	841
Benefits paid in year, net of staff contributions	(509)	(251)	(197)
Actuarial (gains)/losses on liabilities*	708	(968)	(2,205)
Net Pension Liability at 31st December	18,938	17,191	16,803

\*includes impact of changes to the assumptions

### (f) History of Experience Gains and Losses

	Year to 31/12/2009 €'000s	Year to 31/12/2008 €'000s	Year to 31/12/2007 €'000s
Experience (gains)/losses on scheme liabilities amount:	(266)	(430)	(75)
As a percentage of the present value of scheme liabilities	(1.40%)	(2.50%)	(0.45%)
Total actuarial (gains)/losses recognised in STRGL	(708)	968	(2,205)
As a percentage of the present value of scheme liabilities	(3.74%)	5.63%	(13.12%)
Cumulative amount of (gains)/losses recognised in STRGL^	3,085	2,377	3,345

^represents cumulative gains/losses from 31/12/2002 inclusive

The mortality assumptions are based on standard mortality tables which allow for future mortality improvements. The mortality basis explicitly allows for improvements in life expectancy over time, so that life expectancy at retirement will depend on the year in which a member attains retirement age (age 65 years). The table below shows the life expectancy for members attaining age 65 in 2010, 2030 and 2050.

Year attaining age 65	2010	2030	2050
Life expectancy – Male	87	90	92
Life expectancy – Female	89	91	93

## 8. DEBTORS

	2009 €	2008 €
Debtors for Services	121,813	170,653
Bad Debts Provision	(5,778)	(6,311)
Prepayments	188,076	127,358
	304,111	291,700

## 9. CREDITORS

	2009 €	2008 €
Accruals	320,064	418,444
Collector General	33,430	9,646
	353,494	428,090

## 10. CAPITAL GRANT IN ADVANCE

This represents Capital Grants received in respect of projects that were not completed during the year:

	2009 €	2008 €
Opening Balance at 1st January	3,850	231,973
Transfer to/(from) Capital Account	28,284	(228,123)
Balance at 31st December	32,134	3,850
This figure comprises:		
Capital Expenditure for the Year	(351,716)	(1,028,123)
Grant Received	380,000	800,000
	28,284	(228,123)

## 11. PROVISION FOR DISPOSAL OF RADIOACTIVE SOURCES

The Institute holds a number of radioactive sources, some of which will be held for several years. This figure is made up of a provision of €25,000 for the disposal of a radioactive source that was decommissioned in 2009 and will be disposed of in 2010, and also for the provision of €18,400 in respect of a new source that was commissioned in 2009 and will be disposed of when it is decommissioned some years hence.

## 12. APPROVAL OF FINANCIAL STATEMENTS

The financial statements were approved by the Board on 13th September 2010.









**Radiological Protection Institute of Ireland**

An Institiúid Éireannach um Chosaint Raideolaíoch

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