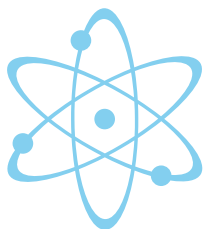




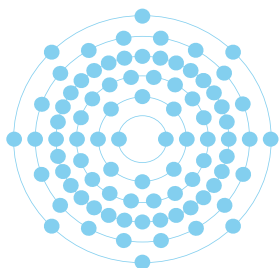
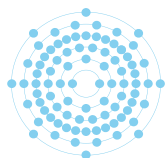
Radiological Protection Institute of Ireland
An Institiúid Éireannach um Chosaint Raideolaíoch

ANNUAL REPORT & ACCOUNTS **2004**





The cover design uses a schematic representation of an atom and the shell structure of radon. Also shown is an RPII inspector carrying out an inspection at an industrial premises.



RADIOLOGICAL PROTECTION INSTITUTE OF IRELAND
AN INSTITIÚID ÉIREANNACH UM CHOSAINT RAIDEOLAÍOCH

ANNUAL REPORT AND ACCOUNTS 2004

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 2004.

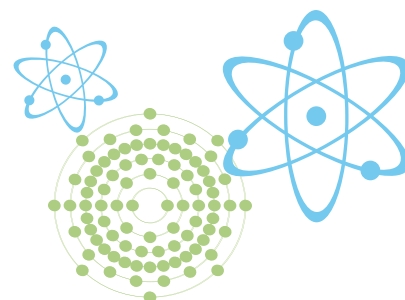
Francis J Mulligan, Chairman

Radiological Protection Institute of Ireland
3 Clonskeagh Square, Clonskeagh Road, Dublin 14.

T: 01 269 7766 **F:** 01 269 7437 **W:** www.rpii.ie

Printed on recycled paper.

“Our mission is to **protect** people from the harmful effects of ionising radiation, both natural and man-made, through effective **regulation**, monitoring of the environment and the provision of accurate and timely **advice** to the public and to Government”.



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I am pleased to introduce the Annual Report and Accounts of the Radiological Protection Institute of Ireland for 2004. The year was one of good progress in enhancing in a number of ways the protection of people in Ireland against hazards arising from ionising radiation, whether these hazards originate from within the country or from abroad.

As it is by far the dominant source of radiation exposure of the population, the Institute continues to devote significant effort to its programme of reducing exposure to radon both at home and in the workplace. The increase of more than 150% in the number of radon measurements undertaken by householders during the year as compared with previous years demonstrates the success of this programme. The result of research commissioned by the Institute which found that 75% of the general population is aware of radon gas is also an indicator of progress. However, despite increasing awareness of the issue, the number of houses with radon levels above the Reference Level which have been identified to date remains very low at about 3.5% of the total estimate of 91,000. Of the high houses identified, indications are that less than 100 have been remediated. While the apparent apathy in Ireland concerning radon mirrors that in many other countries, the health risk is such that the issue cannot be ignored and the Institute is committed to developing new and innovative strategies to encourage householders to reduce exposure to radon in their homes.

The programme to bring employers' attention to the legislation introduced in 2000 governing radon in the workplace has received a very positive response. The strategy of forming alliances with employer and worker representative groups at both national and local level is particularly successful and will continue to be an important element of the workplace programme. In addition, the Institute has a role in enforcing the legislation. During the year, a number of employers in High Radon Areas were directed to carry out radon measurements and legal proceedings against those who failed to comply with the directions are now in train.

In schools, the very successful programme of radon measurement undertaken on behalf of the Department of Education and Science has been completed. The Institute is particularly pleased that a comprehensive programme of remediation works is underway to reduce the radon levels in those schools found to have radon concentrations above the Reference Level. The completion of this programme will ensure that the exposure of children and adults to radon in schools is as low as reasonably achievable in line with best radiological protection practice.

Public concern about the possibility of an accident at a nuclear installation abroad remains very high. The Institute attaches particular importance to its role of advising Government on all aspects of nuclear safety and Ireland's emergency preparedness arrangements and recognises the importance of keeping up to date

CHAIRMAN'S STATEMENT



with developments in these fields. To this end, during the year, a delegation of five senior scientists from the Institute, led by the Chief Executive, visited the nuclear reprocessing plant at Sellafield. As a result of the visit, the Institute was in a position to provide comprehensive information to Government on the long term plans for the site. The exact details of potential accident scenarios were not made available to the Institute for security reasons, and this limits our ability to accurately assess the implications for Ireland of an accident at Sellafield. A report of the visit was also published.

At national level, the continuing development and updating of the National Emergency Plan for Nuclear Accidents will help to ensure that Ireland is prepared to deal with the consequences of a nuclear accident abroad. Experience in other countries and in fields other than nuclear safety has shown that plans that are well developed and exercised regularly can contribute significantly to mitigating the potential consequences of any such accident. Developments during the year such as the upgrading of the network of Permanent Monitoring Stations and the revision of the Institute's sub-plan improve the overall reliability of the arrangements. Further work on the upgrading of air-sampling equipment is also scheduled.

The use of ionising radiation in Ireland continues to expand, particularly in the medical field. Through its programme of licensing and inspection, the Institute aims to ensure that those working with ionising radiation and the general population are not subjected to unnecessary exposure. During 2004, there was generally good compliance by licensees with the regulations. However, the small number of incidents which did come to our attention highlighted the importance of ensuring that appropriate procedures are in place to limit exposure and that responsibility for sources is clearly assigned. A particular problem arises when sources are no longer in use and one company was successfully prosecuted during the year for unlicensed disposal of a nuclear device. While responsibility for radioactive sources clearly rests with licensees, the safety and security of sources, particularly when they are no longer in use, gives rise to a heightened level of concern. This concern is reflected internationally where the potential for the diversion of such sources for malevolent purposes is now under active consideration. In addition, some of the worst radiological accidents globally have involved disused sources falling out of regulatory control and have resulted in the loss of life as well as widespread radioactive contamination of the environment. Many disused sources which were acquired before the introduction of supplier take-back agreements are held in storage under licence throughout Ireland but without any provision for their final disposal. This continues to be an unsatisfactory situation and it is important that this long standing issue be resolved. In addition, the management, including storage, of disused high activity sources as well as those that are occasionally discovered – the so called 'orphan' sources will have to be addressed

in the context of the transposition of the High Activity Sealed Sources Directive which will come into force on the 1st January 2006

On my own behalf, and on behalf of the Board members, I wish to thank all of the staff of the Institute for their dedication and hard work during the year. In particular, I acknowledge their enormous contribution to the organisation review and their commitment to the implementation of the ensuing recommendations.

I wish to record my own thanks and that of the Institute to Dr Edward Fitzgerald who retired from the Board on the 3rd of May 2004 after 7 years service. As a nominee of the Faculty of Radiologists of the Royal College of Surgeons, Dr Fitzgerald made a very valuable contribution to the work of the Institute. I welcome Dr Séan Darby to the Board in his place.

I wish to thank also the members of the Institute's three Advisory Committees, on Environmental Radiation, Medical Radiation, and Public Relations, for generously giving of their time and expertise to assist the Institute in addressing a wide variety of issues which arose during the year.

Finally, I wish to record the Institute's appreciation for the support and encouragement received from the Minister for the Environment, Heritage and Local Government, Mr Dick Roche, TD. The Institute is also indebted to the officials of the Nuclear Safety Section of the Department of the Environment, Heritage and Local Government and other officials in the Department for their wholehearted co-operation at all times. The helpful collaboration of other Government Departments, third-level educational institutions and other external organisations with which the Institute has worked during 2004 is also gratefully acknowledged.

A handwritten signature in black ink, reading "Francis J. Mulligan". The signature is written in a cursive, flowing style.

Francis J. Mulligan
Chairman

MAIN DEVELOPMENTS



EMERGENCY PREPAREDNESS

2004 saw a number of developments in different areas of the Institute's work which enhance our ability to deal with radiological accidents, whether they arise at nuclear installations abroad or through the use of sources of ionising radiation by licensees in Ireland.

During the year, the Institute commenced the upgrade of the national network of Permanent Monitoring Stations (PMS) which are used to gather data on ambient gamma dose rates. This upgrade, together with the establishment of a further three stations along the east coast, is due to be completed in 2005. In addition, the Institute concluded arrangements with the relevant UK authorities for the automated exchange of gamma dose monitoring data between the UK Radioactive Incident Monitoring Network (RIMNET) and the Irish PMS network. This arrangement allows the Institute to view data from 92 monitoring stations across the UK on an hourly basis.

A review of the Institute's role under the National Emergency Plan for Nuclear Accidents was undertaken and a revised sub-plan setting out a framework for emergency preparedness arrangements for all staff was prepared. The Environmental Laboratory successfully exercised its role in the collection and analysis of samples over a two day period.

In July, the Regulatory Service issued a statutory direction to 137 licensees to prepare an appropriate intervention plan to deal with a radiological emergency resulting from their practices which might give rise to a significant hazard to members of the public. By the end of the year, all licensees had responded.

ADVICE TO GOVERNMENT

Continuing the trend over recent years, significant effort was directed to providing advice to Government on matters relating to nuclear safety and to strengthening Ireland's participation in international discussion of these issues.

A key event during the year was the visit to the Sellafield site in Cumbria by five of the Institute's senior staff. The purpose of the visit, which was preceded in August by a detailed briefing session with the UK nuclear regulators, was to see at first hand a number of the key facilities of particular interest and concern to Ireland and to explore the changing nature of operations at the site. The facilities visited included the Highly Active Storage Tanks (HASTs) which, in the Institute's view, is of most significance in terms of risk to Ireland from an accident at the site. The findings of the visit were published in a report which was presented to the Minister for the Environment, Heritage and Local Government at a press conference in April 2005.

The Institute represented Ireland on the Radioactive Substances Committee of OSPAR, which worked during 2004 to further develop the concept of baselines for radioactive discharges, concentrations

of radioactivity in the environment and radiation doses from non-nuclear industries.

HIGH ACTIVITY SEALED SOURCES (HASS) DIRECTIVE

During 2004, the Institute undertook a detailed examination of the provisions of the HASS Directive which came into force at the end of 2003 and is scheduled to be transposed into law by 1st January 2006. While the existing regulatory structure in Ireland should meet the regulatory requirements of the Directive, other aspects may need to be provided for in legislation. In addition, the practical management of disused sources and orphan sources including their storage will have to be addressed. A report on the matter has been submitted to Government.

RADON

During 2004, there was a very significant increase in radon measurements undertaken by householders, with the number rising from 1160 in 2003 to 2948 in 2004. This increase appears to be linked to on-going publicity surrounding the discovery of the very high radon level in a house in the Castleisland area of Co. Kerry in 2003. In July, the Institute published the results of the national survey of radon in schools which was undertaken on behalf of the Department of Education and Science (DES) between 1998 and 2002. The survey found that of the 3444 schools included, a total of 898 had radon concentrations in excess of the Reference Level in one or more ground floor rooms. In November, the Institute issued a further report to the DES setting out the results of a later survey of the schools who did not participate in the original survey. In this case, of the 450 schools measured, 86 were found to have radon concentrations above the Reference Level in one or more ground floor rooms. The programme of implementation of the new legislation governing radon in the workplace continued with further directions to measure radon being issued to employers in Tralee and Ennis during May and June. The Institute collaborated with the State Claims Agency to heighten awareness of radon among state employers.

ORGANISATION REVIEW

An Institute wide organisation review was undertaken during the year with particular emphasis on the organisation structure, staffing, systems, process and finances. The review was facilitated by consultants and involved all staff. The final report of the review made recommendations covering structure, management, staffing issues and needs and business process efficiency and effectiveness. Implementation of the recommendations began in late 2004 and is due to be completed during 2005.

STAFF STRUCTURE



BOARD

92
U
[238.029]

94
Pu
[244]

ADVISORY
COMMITTEES



CHIEF EXECUTIVE
Ann McGarry

88
Ra
[226.25]

86
Rn
[222]

55
Cs
[136.907]

84
Po
[209.983]



DIRECTOR OF
CORPORATE SERVICES

Barbara Rafferty

Finance/Administration/
Governance
Human Resources
Library
IT/Customer Services
Document Management



DIRECTOR OF
ADVISORY SERVICES

Tony Colgan

Communications
Radon Advice

Nuclear Safety:
Emergency Preparedness,
Reactor Technology



DIRECTOR OF RADIATION
MONITORING AND
MEASUREMENT SERVICES

David Pollard

Measurement Services
Radiation Monitoring

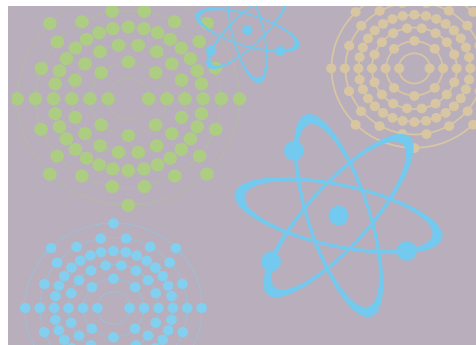


DIRECTOR OF
REGULATORY SERVICES

Tom Ryan

Medical Dental and Veterinary
Industrial

MEMBERS OF THE BOARD



On 3rd May 2004 the term of office of Dr E. Fitzgerald expired.
Dr S. Darby was appointed to the Board with effect from 2nd September 2004.

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.

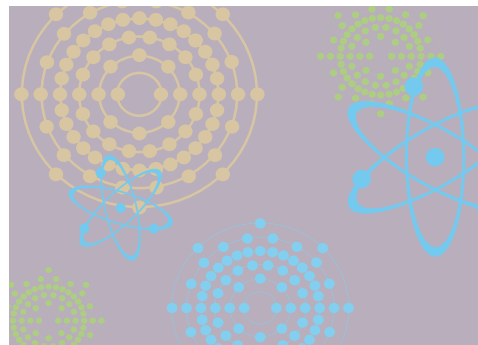
Chairman	Francis J. Mulligan	8(8)
	William Blunnie	4(8)
	<i>Medical Council</i>	
	Gregory Burke	8(8)
	<i>Institute of Food Science and Technology of Ireland</i>	
	Kieran Byrne	2(8)
	Patrick Connellan	5(8)
	<i>Dental Council</i>	
	Séan Darby	1(3)
	<i>Faculty of Radiologists RCSI</i>	
	Anita Dowling	5(8)
	<i>Association of Physical Scientists in Medicine</i>	
	Edward Fitzgerald	2(3)
	<i>Faculty of Radiologists RCSI</i>	
	James Fitzmaurice	6(8)
	Lesley Malone	6(8)
	<i>Irish Nuclear Medicine Association</i>	
	Darina Muckian	5(8)
	Adi Roche	6(8)
	Francis J. Turvey	8(8)

Membership of the Board's audit committee:

Dr F. J. Mulligan, Dr P. Connellan and Mr J. Fitzmaurice.

The total figure for Board remuneration and expenses in 2004 was €82,790.

ADVISORY COMMITTEES



ENVIRONMENTAL RADIATION ADVISORY COMMITTEE

This Committee provides advice on radioactivity in the environment and on the co-ordination with other bodies of joint work programmes in this area.

Chairman

Gregory Burke
Tony Colgan
David Fenton
Dermot Howett
Ian R. McAulay
Ann McGarry
James P. McLaughlin
Peter I. Mitchell
Darina Muckian
Geraldine O'Reilly
David Pollard
Wil van der Putten (retired 2004)
Barbara Rafferty
William Reville
Adi Roche
Philip Walton
Stephanie Long

Scientific Secretary

MEDICAL RADIATION ADVISORY COMMITTEE

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

Chairman

George Duffy
Fionnuala Barker
David Clarke
Mary Coffey
Louise Diamond
Stephen Fennell
David Fenton
Edward Fitzgerald
Christopher Hone
Dermot Howett (appointed 2004)
Lynn Johnston
Pat Kenny
Brendan McClean
Ann McGarry
Lesley Malone
James Masterson
Kate Matthews
Michael Moriarty
Dan Murphy (retired 2004)
Geraldine O'Reilly
Wil van der Putten
Stephanie Ryan
Tom Ryan (appointed 2004)
Tanya Kenny

Scientific Secretary

PUBLIC RELATIONS CONSULTATIVE COMMITTEE

This Committee provides advice relating to public relations.

Chairman

James Fitzmaurice
Gregory Burke
Marie Kelly
Ann McGarry
Barbara Rafferty (retired 2004)
Tony Colgan (appointed 2004)

OBJECTIVES OF THE INSTITUTE



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.

STAFF AND RESOURCES



ORGANISATION REVIEW

An Institute wide organisation review was undertaken during 2004. Consultants were engaged to examine the organisation in terms of staffing, structure, systems, process and finances, and to make suggestions for improvements in structure, management, staffing issues and needs, and business process efficiency and effectiveness. The final report found that while services and standards in many areas were excellent, some re-organisation and streamlining could lead to enhanced efficiency and effectiveness. Examples of recommended changes included the centralisation of all support services, a greater emphasis on human resources and strengthening support for quality customer services. A plan to deliver upon the recommendations was proposed, and is currently being implemented.

STAFF

The Institute's approved staff complement increased from 45 to 46 in 2004. The temporary position at Principal Scientific Officer, sanctioned in 2003 in support of the additional requirements for scientific advice relating to the Government's legal actions against Sellafield, was confirmed on a permanent basis in 2004. As a consequence of this post being filled by an internal candidate, a permanent Senior Scientific Officer post and permanent Scientific Officer post were generated, each of which have been filled.

Dr T. Ryan returned to the Institute in January 2005 following his 2-year secondment as a National Expert in the EU Directorate General for Environment based in Luxembourg.

EQUALITY

The Institute is committed to a policy of equal opportunity in all aspects of its activities. Particular attention is given to equality in recruitment, conditions of employment and access to promotion, training and career development. The Institute recognises that flexible working arrangements are an important component of equality policies and operates such schemes as flexitime, study leave, career breaks and work-sharing. Currently, nine of the Institute staff avail of the work-sharing option enabling them to achieve their own personal work-life balance.

PARTNERSHIP AND PARTICIPATION

The Institute's Participation Forum, established under the terms of the Worker Participation (State Enterprises) Act, 1988, provides a sub-Board mechanism for consultation with staff at all levels in the organisation about matters affecting the operation and effectiveness of the Institute. The Participation Forum meets regularly throughout the year, and in 2004, it played an important role in meeting the requirements of the Modernisation Programme which is provided for under the Programme for Prosperity and Fairness. Issues addressed

by the Forum in 2004 included establishment of an internal seminar programme, reporting arrangements under the Sustaining Progress Action Plan, the delivery of improved Customer Services, and improvements in Institute facilities.

Towards the end of the year, the Forum discussed the option of establishing a Partnership arrangement for the Institute. A seminar was held for all staff to provide information on the Partnership concept and to promote further discussion on the issue. The Forum subsequently decided to establish a working group to formulate a Partnership strategy for the Institute. In early 2005, the findings of the working group paved the way for the establishment of an Institute Partnership Committee to replace the Workers Participation Forum.

PERFORMANCE MANAGEMENT AND DEVELOPMENT

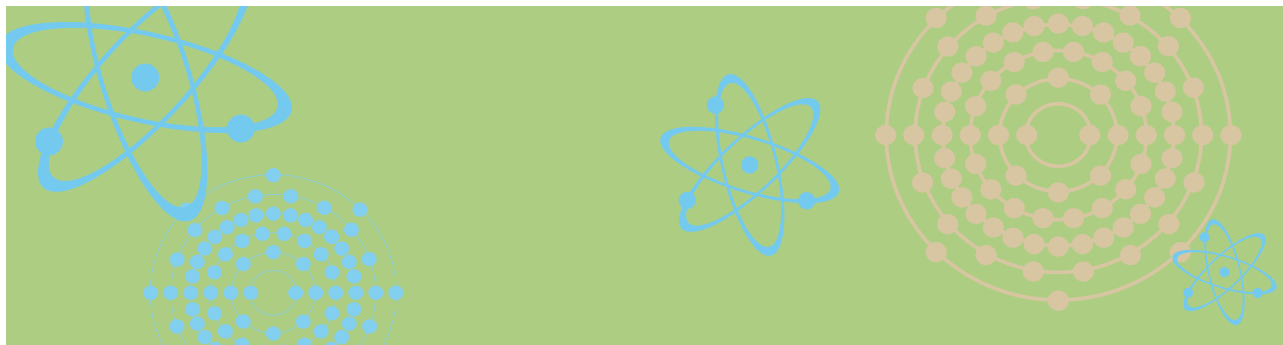
2004 saw the introduction of a Performance Management and Development System (PMDS) for the Institute. Following consultation with staff a customised PMDS was designed by a staff team, based on the civil service model, incorporating role profiling, performance review, upward feedback and personal development planning. All personnel received training in the new system and, from May the first cycle of role profiling and review was successfully implemented.

FREEDOM OF INFORMATION

Late in the year, the Institute was notified that the Freedom of Information Act, 1997 (FOI), would be extended to the Institute with effect from November 2005. In preparation for this event, the experts engaged to develop and implement a records management strategy for the Institute (see Library and Information section), were tasked with the drafting of the necessary supporting documentation. As the volume of FOI requests that will be generated is difficult to predict, the impact of this development on staffing and resources is not easy to quantify. However, on the basis of current resources and work demands, it is expected that even a relatively low level of uptake will present significant challenges.

CUSTOMER SERVICE

The Institute is committed to the provision of high quality services to all its customers across the full range of its activities. A Customer Service Charter is in place which sets out our commitments to our customers. All of the Institute's measurement services are accredited by the National Accreditation Board.



SAFETY HEALTH AND WELFARE

The Institute is committed to complying fully with the requirements of the legislation relating to safety, health and welfare at work.

The Institute's safety strategy is set out in its Safety Statement. A Safety Committee under the chairmanship of an elected Safety Officer monitors safety compliance in the organisation and makes recommendations for improvement where necessary.

FINANCE

The Institute's income in 2004 was €4.629 million made up of grant of €3.310 million and €1.319 million in earnings from licence charges, and dosimetry, product certification, radon measurement and other services. Capital expenditure was €425,635. Expenditure for the year exceeded income by €1,798.

The Institute complies with all procurement regulations and it has procedures in place to ensure that all invoices received are paid within the time limits specified on the invoices or the statutory time limit if no period is specified.

ENERGY AND EFFICIENCY

In keeping with Government policy on energy efficiency in State bodies, the Institute's Energy Conservation Working Group has implemented a number of energy saving projects. Recently the remit of the working group has been expanded to include waste management and recycling. Issues which are currently being addressed include reducing the consumption of paper and ensuring that all used paper is recycled, recycling of packaging materials and reducing the quantities of consumables used in the Institute's laboratories.

INFORMATION TECHNOLOGY

Technology and in particular communication technologies are advancing very rapidly. During 2004, the Institute continued to develop its Information Technology (IT) infrastructure, making use of these new technologies, to improve the way in which it conducts business.

One of the main advances in 2004 was the installation of a remote access solution. Extending access to networked services, making them easily accessible globally, enhances the effectiveness of staff whether travelling locally or internationally.

Other significant developments during the year included improvements in printing through the use of network linked photocopiers; extending the Institute's network usage policy and the replacement of old desktop equipment.

ENVIRONMENTAL MONITORING AND RESEARCH



The principal aim of the Environmental Laboratory is to measure the levels of radioactivity in the environment and to assess their impact on the Irish population. This is achieved through the implementation of a number of comprehensive monitoring programmes. The numbers and types of samples tested during 2004 are given in Table 1. The total number of samples tested of 2378 is broadly similar to previous years with 2189 and 2478 in 2002 and 2003 respectively. An additional responsibility of the Laboratory is to develop and maintain expertise in sample collection and analysis in the event of a nuclear emergency. To this end, the Laboratory successfully exercised its emergency plan over a two-day period during 2004.

The results of the environmental analyses are published in the reports: Radioactivity Monitoring of the Irish Marine Environment and the Environmental Radioactivity Surveillance Programme. Data are also submitted annually to the European Commission's database at the Joint Research Centre in Ispra, Italy. The Commission periodically publishes a compilation of these data for all Member States.

Table 1: Radioactivity Testing of Environmental Samples and Foodstuffs, 2004

Sample Type	Number
Air	514
Beef	31
Lamb	93
Pork/Poultry	54
Drinking water	207
Fish and shellfish	232
Seawater, seaweed & sediment	248
Milk and dairy products	464
Pharmaceuticals and food additives	255
Other foodstuffs	125
Effluent samples	97
Miscellaneous	58
Total	2378

The Institute is designated as the national laboratory for the measurement of radioactivity in foodstuffs in accordance with the European Communities (Official Control of Foodstuffs) (Approved Laboratories) Order, (S.I. No. 95 of 1998). Great emphasis is placed on quality assurance in all aspects of its work and all its key analytical procedures are accredited to the International Standard ISO 17025 by the Irish National Accreditation Board. The Laboratory increased its scope of accreditation during 2004 to include the measurement of radon in drinking water.

MARINE ENVIRONMENT

The main source of anthropogenic radioactivity in the Irish Sea remains the discharges from the British Nuclear Fuels plc (BNFL) nuclear fuel reprocessing plant situated at Sellafield on the north-west coast of England. There are, however, a variety other sources including hospital discharges and fallout from nuclear weapons testing.

Institute staff, with the assistance of Fisheries Quality Officers of the Department of Communications, Marine and Natural Resources carry out a comprehensive marine monitoring programme. During 2004, this included the collection and analysis of samples of a wide range of fish and shellfish from major landing ports and aquaculture areas. In addition, seawater, seaweed and sediment were collected from coastline locations and from the western Irish Sea using the Marine Institute's Research Vessel, the Celtic Voyager.

The data gathered during this programme is used to assess the radiation exposure of the Irish population via the marine environment. During 2004, the most important exposure pathway continued to be the consumption of seafood. The dose to consumers who eat substantial quantities of seafood (200 g of fish and 20 g of shellfish per day) was estimated to be less than 2 microsieverts (μSv) for 2004, similar to that in previous years. Marine based activities such as boating, swimming, spending time on beaches and fishing result in a negligible additional dose. To put the dose to seafood consumers in perspective, it may be compared to that arising for a heavy seafood consumer from the presence of naturally occurring polonium-210 in seafood, which is estimated to be 148 μSv ; and to the average annual dose to a member of the Irish population from all sources of radiation of 3620 μSv .

In order to maintain navigation in ports, harbours and inland waterways and to develop port facilities, it is necessary to dredge the seabed and dispose of the dredged material at sea. A small fraction of this material is contaminated by human activity, including radioactivity. Consequently, disposal is subject to constraint on a global basis under the 1972 London Convention. During 2004, the Institute continued to carry out testing on such material on behalf of companies undertaking dredging work to ensure compliance with this Convention.

The commissioning and operation of new facilities at Sellafield in the mid 1990s resulted in an increase in the discharges of technetium-99 to the Irish Sea, which was reflected in an increase in the activity concentrations of this radionuclide at all east coast sampling sites. Despite these increases, the low radiotoxicity of technetium-99 means that caesium-137 continues to be the most significant radionuclide in terms of radiation dose.

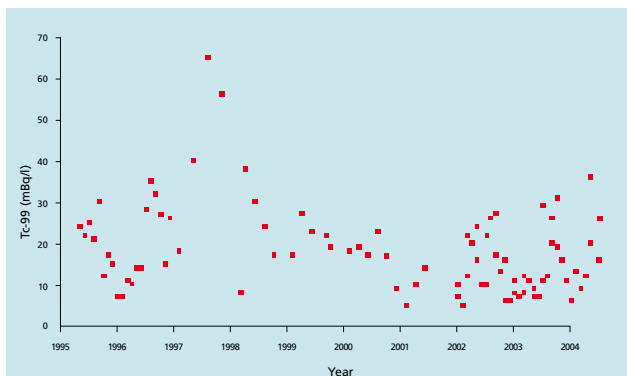


Figure 1: Technetium-99 Concentrations in Seawater (mBq/l) from Dublin Sampling Sites, 1995 to 2004

During 2004, a new waste treatment technique, which, during trials, removed approximately 97% of technetium-99 from liquid waste, was implemented at Sellafield. Consequently, BNFL's annual limit for technetium-99 discharges was reduced from 90 terabecquerels (TBq) per year to 20 TBq per year in October 2004. To date, this reduction has not been reflected in measured concentrations in the western Irish Sea but this is not unexpected given the seasonal variation in technetium-99 concentrations and its transit time to the western Irish Sea of approximately six months. Technetium-99 concentrations in seawater at Dublin sampling sites, between 1995 and 2004 are given in Figure 1.

The results of the marine monitoring programme show that, while the levels of anthropogenic radioactivity in the marine environment remain detectable, they are low and do not pose a significant risk to health.

TERRESTRIAL ENVIRONMENT

As with the marine environment, concentrations of radioactivity in the terrestrial environment are predominantly of natural origin. The minor sources of artificial origin include authorised discharges from nuclear installations, fallout from the Chernobyl accident in 1986 and atmospheric nuclear weapons testing during the 1950s and 1960s.

The terrestrial monitoring programme is carried out to further assess the impact of radioactivity in the environment on the Irish population. This is accomplished with the assistance of the Department of Agriculture and Food, the Food Safety Authority of Ireland, Local Authorities, the Health Service Executive and commercial producers.

During 2004, the dairy monitoring programme continued with the collection of monthly samples from ten milk-processing plants. These samples were analysed for strontium-90 and gamma emitting radionuclides. While particular importance is placed on the analysis of milk as an indicator of radioactivity in the food chain, a wide variety of other foodstuffs were measured for their radioactivity content. These foodstuffs included samples of dairy produce, beef, grains, lamb, pork, and poultry. The samples originated from locations across the country and were supplied to the Institute by the Health Service Executive as part of ongoing monitoring and by food processors as part of a measurement service to the food industry. In addition, complete meals available at restaurant facilities in Dublin and Galway with a high volume turnover were measured for gamma emitting radionuclides. Samples of lamb from upland areas in which fallout of caesium-137 from the Chernobyl accident still persist were also analysed. While traces of caesium-137 were measured in a small number of lamb samples, the vast majority of these results were below the detection limit of the measurement system.

Samples of drinking water from ten counties were sampled and analysed as part of the drinking water monitoring programme. Drinking water samples were also analysed on behalf of members of the public and commercial clients for total alpha and total beta, tritium and dissolved radon concentrations. In all cases the requirements of the European Communities Drinking Water Regulations, 2000, Statutory Instrument No. 439 of 2000, were met for analyses of total alpha, total beta and tritium concentrations. A small number of drinking water supplies exceeded the recommendations of the European Commission Recommendation on the protection of the public against exposure to radon in drinking water supplies (2001/928/Euratom).

The results of the terrestrial monitoring programme show that the levels of anthropogenic radioactivity in the terrestrial environment remain low and do not pose a significant risk to health. However, the results of measurement of radon in drinking water show that a small number of ground water supplies exceed the levels recommended by the European Commission. In the case of private supplies found to be in excess of the EC levels, the householders were advised by the Institute to consider remediation, while in the case of public supplies this advice was directed at the relevant local authority.

ATMOSPHERIC ENVIRONMENT

Atmospheric monitoring is carried out in order to monitor the impact of airborne discharges from nuclear facilities and to detect any increased atmospheric discharges at an early stage. This is carried out with the assistance of Met Éireann.

During 2004, airborne radioactivity monitoring continued at 11 stations throughout the country. These included nine low-volume sampling stations and two high-volume stations. Results show that no activity above natural background levels was measured during 2004 on the low-volume systems, while traces of caesium-137 were measured on the high-volume systems consistent with expected concentrations arising from global circulation of weapons test fallout.

The concentration of krypton-85 in air was measured on a fortnightly basis at Clonskeagh, Dublin. This inert gas is released into the atmosphere as a result of nuclear fuel reprocessing. Within a few years after release, krypton-85 distributes uniformly throughout the earth's atmosphere due to its low capacity to react with other materials. The two main sources in Western Europe of krypton-85 are BNFL Sellafield and Cogema La Hague on the northwest coast of France. The krypton-85 emissions from BNFL Sellafield and Cogema La Hague between 1989 and 2004 are presented in Figure 2 along with the annual baseline concentrations measured at Clonskeagh. Cogema La Hague has a higher emission rate of krypton-85 than BNFL Sellafield due principally to its current larger nuclear fuel throughput. This shows that the baseline concentrations over Dublin follow the same trend as the discharges from Cogema La Hague with a lag of approximately one year.

The results of the atmospheric monitoring programme show that the levels of anthropogenic radioactivity in the atmosphere remain low and do not pose a significant risk to health.

RADIOACTIVITY IN EXPORTED PRODUCE

The Environmental Laboratory provides testing and certification services to Irish exporters of foodstuffs and other goods. The number of certificates issued during 2004 was 4242 compared to 4581 issued in 2003 and 4587 in 2002, indicating a steady demand for this service.

RADIOECOLOGICAL RESEARCH

Environmental impact assessment of iodine-131 discharged from hospitals

Contracting parties to the OSPAR Convention are required to prepare national plans for the implementation of the "OSPAR Strategy with Regard To Radioactive Substances". One of the goals of the Irish National Plan was to carry out an environmental impact assessment to evaluate radiation doses to a critical group and to the general public as a result of discharges of radioactivity to the marine environment from Irish facilities. The main source of these discharges is disposal via the sewage system of radioisotopes administered to patients in the nuclear medicine departments of hospitals. Of the several radionuclides used, iodine-131 is the only one that is present in measurable quantities.

During 2004, an environmental impact assessment was carried out on iodine-131 discharges from hospitals to the Dublin Bay area. To this end, a sampling campaign was carried out to collect influent, effluent and processed sludge samples from the Waste Water Treatment Works (WWTW) at Ringsend and seaweed samples, from Dublin Bay. Sampling was timed to coincide with administrations of iodine-131 to thyroid ablation patients at two Dublin hospitals. Analysis of these samples showed that approximately 80% of the iodine-131 activity estimated to have been discharged from the hospitals was detected at the WWTW, of which approximately one quarter was associated with the sludge and approximately three quarters was ultimately discharged to Dublin Bay. The remaining 20% of the iodine-131 is likely to have been retained in the sewer pipes, bound to organic matter which builds up in these pipes.

Concentrations of iodine-131 of up to approximately 600 Bq/kg (dry weight) were measured in the sludge, which ultimately is used as an organic fertiliser. However, because of its short half-life of eight days, contamination of the foodchain is not of concern. The wastewater contained up to 20 Bq/l. Analysis of iodine-131 concentrations in two seaweed species (*Ascophyllum nodosum* and *Fucus vesiculosus*) indicated that the impact of individual administrations were measurable, with concentrations ranging from 17.6 Bq/kg to 62.0 Bq/kg (wet weight). The temporal pattern of iodine-131 uptake by the two species was followed by analysis of daily samples collected over a two-week period.

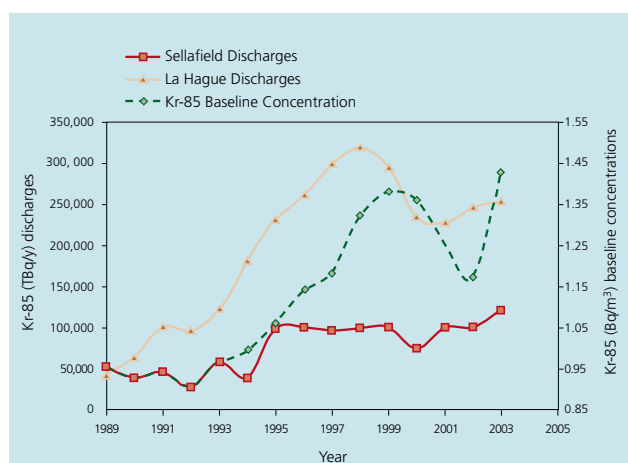


Figure 2: The Annual Baseline Krypton-85 Concentrations Compared to the Annual Discharges from Cogema La Hague and BNFL Sellafield

Doses to sewer workers repairing a blockage on the premises of a disposer and staff at the WWTW were also calculated, these groups were considered to be at the highest risk of exposure to the discharges. For the worst case scenario, doses received by these groups were estimated to be significantly less than the annual dose limit to members of the public from exposure to all controlled sources of ionising radiation of 1 mSv/y.

The principal aim of the Environmental Laboratory is to measure the levels of radioactivity in the environment and to assess their impact on the Irish population.



NATURAL RADIOACTIVITY



Exposure to radon gas is the principal source of radiation exposure to the Irish public, accounting for over 60% of the total dose. During 2004, demand for radon measurements grew sharply with a notable increase in the number of completed radon measurements in both homes and workplaces. Also in 2004, a new radon measurement service operated in co-operation with an approved radon measurement laboratory abroad, commenced operation in Ireland. These developments point to a significant growth in public awareness of radon as a health issue.

Under Part 6 of the Radiological Protection Act, 1991, (Ionising Radiation) Order, 2000, Statutory Instrument Number 125 of 2000 (S.I. No. 125 of 2000), the Institute has a regulatory function governing exposure to natural radiation sources in workplaces. Exposure from natural sources of radiation other than radon may also be of concern in certain work situations such as those found in the gas extracting industry and in the peat and coal firing power generation. Exposure of aircrew to cosmic radiation also falls within the scope of S.I. No. 125 of 2000 and air operators are required to keep records of such doses and to report them annually to the Institute.

RADON IN HOMES

Since the commencement of its radon programme in the late 1980s, the Institute has measured over 25,600 homes and identified approximately 3181 homes with annual average radon concentrations above the national Reference Level of 200 becquerels per cubic metre (Bq/m^3). This represents only 3.5% of the estimated 91,000 dwellings predicted, on the basis of the Institute's National Radon Survey, to have average annual radon concentrations above the Reference Level.

During 2004, radon measurements were completed in 2948 homes. Of these, 426 were found to exceed the national Reference Level. Table 2 shows that this figure is similar to the total number of houses with high radon concentrations identified over the previous three years. Table 2 also shows that the number of homes being measured by the Institute is increasing steadily year on year. Also shown is the number of homes that exceed the national Reference Level which has averaged 14% over the past four years. This is twice the 7% of homes predicted to exceed the national Reference Level on the basis of the National Radon Survey and underlines the success of the Institute's policy of focusing on High Radon Areas in its advertising and media campaigns.

Table 2: The Number of Completed Radon Measurements in Homes

Year	No. of homes measured	No. of homes above 200 Bq/m^3
2001	772	120 (15%)
2002	1034	173 (16%)
2003	1160	181 (15%)
2004	2948	426 (14%)

The increase in the number of radon measurements made in homes during 2004 may be attributed to on-going publicity surrounding the identification in 2003 of a house in the Castleisland area of Co. Kerry where a radon concentration of approximately 49,000 Bq/m^3 was recorded. In May 2004, the Institute published the initial findings of a follow-up survey of radon concentrations in homes in the Castleisland area. Fifty four homes, or 14% of the 383 homes measured, were found to have radon levels above the national Reference Level. The average radon concentration found in the survey was 147 Bq/m^3 and the maximum was 6184 Bq/m^3 , the fourth highest radon concentration ever identified in an Irish home.

Ninety-two local authority homes were also measured for radon by Kerry County Council, one of which was found to exceed the national Reference Level at 617 Bq/m^3 .

In October, the Institute published a new guidance document "Understanding Radon Remediation – a Householder's Guide". This booklet advises householders with high radon concentrations of the various remediation options available to them so that they may make an informed decision on which option would best suit their situation.

RADON IN SCHOOLS

In July 2004, the Institute published the report of the national survey of radon in schools carried out between 1998 and 2002, on behalf of the Department of Education and Science (DES). Radon levels were measured in 3444 schools, representing 85% of all primary and post primary schools in the country. This is one of the most comprehensive surveys of radon levels in schools carried out anywhere in the world.

A total of 898 schools were found to have radon concentrations in excess of 200 Bq/m^3 in one or more ground floor rooms, of which 307 had concentrations greater than 400 Bq/m^3 . The average radon concentration in the schools surveyed was 93 Bq/m^3 . During 2004, the DES continued its programme of remediation in schools found to have radon concentrations greater than 200 Bq/m^3 .

In November 2004, the Institute reported to the DES the results of a survey of 450 of the remaining 525 schools who did not participate in the original survey. The results showed that of the 450 schools measured, 289 were below the Reference Level; 86 had radon concentrations above 200 Bq/m^3 in one or more rooms and 22 of these were above 400 Bq/m^3 . Remediation work to reduce the levels in these schools is currently taking place or has been completed.

RADON IN WORKPLACES

Above Ground Workplaces

S.I. No. 125 of 2000 lays down a Reference Level of 400 Bq/m^3 for exposure to radon in the workplace and the Institute is empowered

to direct employers to measure radon and to take prosecutions against those failing to comply with its directions. After a direction is issued, the employer has six months to comply with the direction. In May and June 2004, the Institute directed 60 employers, 30 in Tralee and 30 in Ennis, to carry out radon measurements. Legal proceedings were initiated by the Institute against 18 companies who failed to comply with the direction.

In January 2004, the State Claims Agency (SCA) identified radon exposure of workers in state buildings as a potential risk of future litigation against the State. The Institute collaborated with the SCA to heighten awareness of radon among state employers and participated in a seminar organised for state bodies. Arising from this initiative, the Institute considered the Reference Level that should apply in long-stay institutions such as prisons and nursing homes. Drawing on the advice of international organisations, the Institute advised that the occupants of such institutions had a right to expect the same level of protection as in their own homes and that therefore the national Reference Level for homes of 200 Bq/m³ should apply.

The Institute also met with employer and trade union groups as part of its efforts to heighten awareness of radon in workplaces. In October, the Institute visited Ballina where staff met with local employers and the local Chamber of Commerce. A presentation was also given to a local school. This proved to be very successful and will provide the basis for similar visits to other High Radon Areas.

Below Ground Workplaces

During 2004, the Institute continued the monitoring of radiation doses to staff working in certain underground workplaces, such as mines and show caves. The numbers of workers monitored in 2004 was 60, compared with 48 workers monitored the previous year.

Results to the end of 2004 indicate that no worker had received a radiation dose in excess of 20 millisieverts (mSv), the annual dose limit for radiation workers. Of the 60 staff monitored, doses for 44 individuals were estimated to be less than 1 mSv. Fifteen individuals were estimated to have received doses between 1 and 6 mSv while one individual was estimated to have received a dose of 7 mSv.

ERRICCA CONCERTED ACTION AND IRISH NATIONAL RADON FORUM

During 2004, the Institute continued to work with its partners under the European Radon Research and Industrial Collaboration Concerted Action (ERRICCA), a three-year project involving 20 European countries operating under the aegis of the European Commission's 5th Framework Programme. ERRICCA provides a platform for scientific and industrial bodies with an interest in radon to interact through national and international meetings.

Under the ERRICCA project, the Institute was responsible for the preparation of two reports reviewing radon mapping and measurement techniques in Europe. Throughout the year, the Institute worked with its ERRICCA partners to ensure that relevant information was gathered and the reports compiled. Both of these reports are now available on the Institute's website. In September, Institute staff gave a presentation at the fifth European ERRICCA forum in London.

The third Irish National Radon Forum, jointly organised by the Institute and Remedix Ltd, was held in Dublin in November. The regulation of radon in above ground workplaces was one of the

principal themes of the forum. In particular, the Institute drew attention to its workplace initiatives, its direction campaigns and efforts to raise awareness of radon in workplaces. The forum also had an industrial module that brought together the different sectors of the radon protection industry in Ireland. It provided for an open discussion on radon measurement programmes both in Ireland and the UK, radon mitigation of existing buildings and observations on the public awareness of radon.

MATERIALS CONTAINING ENHANCED LEVELS OF NATURAL RADIOACTIVITY

Some industries work with materials not generally regarded as radioactive but which, in certain circumstances, have the potential to give rise to radiation doses greater than 1 mSv, the annual dose limit for a member of the public. For this reason, work activities involving such materials potentially fall within the scope of S.I. No. 125 of 2000. These Naturally Occurring Radioactive Materials (NORM) include materials such as scale that may build up in pipes and valves of plants processing natural gas as well as ash from the burning of coal and peat for electricity production.

In 2004, the Institute worked with the ESB in implementing a measurement programme in the largest coal-fired power station in the country. A site visit took place to coincide with a routine furnace maintenance shutdown to investigate the potential occurrence of boiler scales enriched in lead-210. Radionuclide analysis of samples collected at this occasion was carried out and the preliminary results indicate that the levels of lead-210 are very low and unlikely to be of radiological significance. Consequently, there is no requirement to control the further use or disposal of these materials because of its natural radioactivity content. A complete radon survey of all the plant was also carried out and all areas were found to be below the Statutory Reference Level of 400 Bq/m³.

EXPOSURE OF AIRCREW TO COSMIC RADIATION

The exposure of aircrew to cosmic radiation is subject to regulation under S.I. No. 125 of 2000. The holder of an air operator's certificate is required to evaluate the doses received by aircrew to determine if measures to control exposure to cosmic radiation are warranted. The legislation applies to those air operators whose crew are potentially liable to receive an annual dose greater than 1 mSv. This effectively applies only to those airlines flying above 8,000 metres of which there are 7 in Ireland. Such an evaluation must be submitted to the Institute within three months of the end of each calendar year. Doses can be estimated using software produced by the Civil Aerospace Medical Institute in the United States, known as CARI 6 or by using EPCARD which is software produced by the National Research Centre for Environment and Health in Germany. This information is combined with details of an individual's flying hours in order to assess radiation doses.

For 2004, the information received from 7 airlines showed that 3801 individuals were estimated to receive annual radiation doses above 1 mSv. Of these, 1907 received between 1 and 2 mSv, while 1868 received doses between 2-4 mSv and 26 received doses over 4 mSv. No doses over 6 mSv were reported.

EMERGENCY PREPAREDNESS



The Radiological Protection Act, 1991, confers a number of important emergency planning and response functions on the Institute. These include assisting in the planning and implementation of measures to deal with radiological emergencies, advising Government on measures for the protection of individuals and acting as the national competent authority for international agreements in the field of emergency preparedness. National arrangements for response to a widespread radiological incident are set out in the National Emergency Plan for Nuclear Accidents (NEPNA). The Institute plays a crucial role in NEPNA consistent with its responsibilities under the Act.

Each public authority with defined responsibilities under NEPNA is required to have in place a sub-plan setting out its emergency preparedness arrangements. During 2004, an internal working group undertook a major review of the Institute's emergency preparedness arrangements and prepared a revised Institute sub-plan. This revised plan builds on and strengthens previous versions in that it clearly links emergency preparedness with the normal business planning process and sets out a framework for emergency preparedness arrangements across all sections of the Institute.

During 2004, the Institute commenced the upgrade of the national network of Permanent Monitoring Stations (PMSs). A detailed analysis of requirements for gamma dose rate monitoring identified a number of key specifications for the updated system including full automation, publication of data to the internet and rainfall measurement at each station. A detailed specification of requirements was prepared and a Request for Tender was subsequently published in the Official Journal of the European Communities in July. Following the tendering process, a framework contract was signed with a German company, Technidata, for the upgrade and expansion of the existing system.

Another important development during 2004 was the conclusion of arrangements with the UK Department of Environment, Food and Rural Affairs (DEFRA) for the automated exchange of gamma dose monitoring data between the UK Radioactive Incident Monitoring Network (RIMNET) and the Institute's PMS network. In accordance with these arrangements, data is exchanged hourly between the two systems. As a result, data from 92 monitoring stations across the UK can be accessed by the Institute in real time.

The decision support system ARGOS (Accident Reporting and Guiding Operational System) and the Emergency Management Information System (ERMIS) are key tools in the Institute's emergency response arrangements. These systems are updated and developed on an ongoing basis so that in the event of an emergency, responders have available to them the most up-to-date information and assessment tools. The Institute continues to play an active role in the consortium, which manages the ongoing

development of ARGOS. The consortium is comprised of national authorities from Ireland, Denmark, Norway, Sweden, Canada and Estonia. Significant developments on ERMIS during 2004 included the development of an electronic catalogue covering all of the Institute's portable monitoring equipment and the development of an interface to the PMS gamma dose rate database.

The Institute is the national competent authority for the International Atomic Energy Agency's (IAEA) Notification and Assistance Conventions as well as for the EU early warning mechanism, European Community Urgent Radiological Information Exchange (ECURIE), and so plays a critical role in the national arrangements for the early notification of a nuclear accident. During the year, a review was undertaken of the Institute's early notification arrangements, which resulted in a number of changes including the introduction of new alerting procedures, the revision of operating procedures at the Garda communications and control centre and the introduction of arrangements for remote access to emergency response computer systems at the Institute. During 2004, the Institute played an active role in the development of the IAEA action plan for strengthening the international preparedness and response system for nuclear and radiological emergencies through participation in technical meetings and through membership of the Assistance Working Group, which was set up to address the actions in the plan relating to the international framework for assistance.

The Institute implements an on-going programme of training and exercises to maintain effective response capability in the event of an emergency. Training initiatives during 2004 included ARGOS training for members of the technical assessment team, duty officer briefings and a seminar for all staff on the revised internal plan. Tests and exercises included eight international notification and data exchange tests and participation in the UK Level 2 exercise at the Oldbury nuclear power plant.

REGULATORY SERVICE

Sources of ionising radiation are used extensively in Ireland in the medical, industrial and educational sectors. The Institute has the statutory responsibility for regulating all such sources and discharges this responsibility through a regulatory framework that involves licensing and inspections as well as the development of guidance documents and codes of practice in key areas.

LICENSING

In 2004, the Regulatory Service carried out a comprehensive review of its licensing system with a view to streamlining its licence renewal procedures and reducing processing time. In particular, a new system of licensing has been developed to better meet the licensing requirements of the 801 dental licensees which currently represent 55% of all licensees. The new system will be phased in during the coming years and will require all dental licensees to appoint a Radiation Protection Adviser (RPA) to advise on all aspects of radiation protection. The system will also contain installation reporting requirements and specific training provisions for distributors of dental X-ray equipment. Implementation of the system will be monitored closely to ensure that it improves compliance with the Code of Practice for Radiological Protection in Dentistry and that the required level of radiation protection is achieved and maintained throughout the dental sector.

Although the Regulatory Service renewed 208 licences during the year, most of its licensing work was associated with the amendment of 583 existing licences. These amendments ranged from simple changes, such as an appointment of a new radiation protection officer, to more significant ones such as the introduction of a new procedure or instrument in a hospital requiring shielding to be installed and risk assessments to be carried out.

During the year, 98 new licences were issued compared to 73 in 2003 (Figure 3). The number of new licences issued in the dental sector rose from 25 in 2003 to 40 in 2004 and in the veterinary

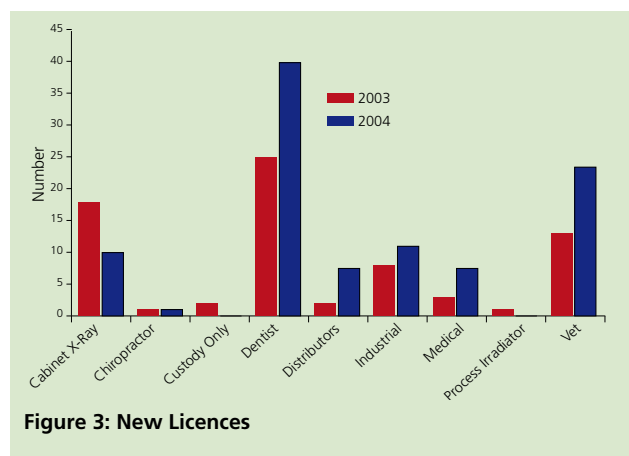


Figure 3: New Licences



sector from 13 in 2003 to 22 in 2004 reflecting targeted inspection and promotional activity by the Regulatory Service in these sectors. However, there is evidence to suggest that substantial numbers of dental practitioners in possession of X-ray equipment continue to operate without a licence from the Institute and a strategy to address this situation is being developed.

INSPECTIONS

During the year the Regulatory Service undertook 229 inspections. This was the highest number of inspections undertaken in one year since 1997 and was made possible by the addition of two new inspectors to the programme. The number of inspections per type of licensee is presented in Table 3.

Table 3: Licence Categories and Inspections

Licence Category	Number in Category	Inspections Undertaken in 2004
Process Irradiators & Cyclotron	5	5
Industrial Radiography	18	13
Lightning Preventors	9	3
Manufactures of Devices	4	2
Industrial Users	229	77
Education & Research	18	7
Government Departments & State Run Services	11	6
Hospitals/Medical	128	41
Custody Only	26	14
Distributors	54	17
Veterinary Surgeons	154	28
Dentists	801	12
Chiropractors	10	2
Contaminated Scrap Metal	2	2
TOTAL	1469	229

Each year, the Regulatory Service targets specific areas in the medical sector for high-level inspection. These inspections are undertaken with the assistance of an external consultant and over the past few years have included all radiotherapy and nuclear medicine departments throughout Ireland. In 2004, these inspections were focused on interventional radiology departments and, reassuringly, the standards of radiation protection practice were found to be very high.

Since the events of 9/11 there is now an enhanced focus worldwide on the security of radioactive sources due to their potential use in 'dirty' bombs by terrorists. In May, the Regulatory Service met with members of the National Crime Prevention Office of An Garda Síochána with a view to strengthening the security aspects of the custody of radioactive sources in Ireland. As a follow up to this meeting, a joint inspection of an industrial irradiation facility was carried out in November with further joint work planned for 2005.

HIGH DOSE REPORTS

All employees working with radiation are required to wear a dosimeter. It is a condition of each licence that the Regulatory Service must be notified of any dose recorded on such a dosimeter which exceeds 2 mSv in any sixteen week period. The Regulatory Service was notified of 17 such reportable doses during the year ranging from 2.0 to 118.8 mSv. Following investigations into each recorded dose, only three of them were classified as doses received by the wearer – one by an industrial radiography worker (2.8 mSv) and the second and third (contiguous doses of 11.3 mSv and 5.2 mSv) by a source handler involved in the transport of unsealed sources. In the case of doses received by the source handler, the investigation was able to identify that the cause was due to the unsealed sources being located too close to the driver's seat in the delivery vehicle. The licensee was directed to modify its work practices and to improve the training provided to its employees to ensure that they adhere to the Institute's Notes for Drivers and Others Involved in Road Transport of Radioactive Materials. Subsequent dose monitoring has confirmed that neither this individual, nor others employed by the licensee, have received any subsequent dose as a result of this work. The highest dose reported (118.8 mSv) was found to be as a result of the dosimeter having been accidentally left in a radiotherapy treatment room and did not represent a dose to the worker to whom the dosimeter had been assigned.

MEDICAL ISSUES

During 2004, substantial progress was made on the establishment of the medical Radiation Protection Adviser (RPA) register as required under S.I. No. 125 of 2000. An assessment committee was formed comprising of three senior staff members of the Institute and two external experts in the field of medical radiation protection. In December, the Regulatory Service held an information meeting for existing RPAs during which the eligibility criteria for inclusion on the register was outlined. Applications for inclusion on the register will be invited in 2005.

With the Government's commitment to improving access to oncology services in the public healthcare system and the increasing demand for such services in Ireland, it is anticipated that providing guidance and advice on the planning and installation of new radiotherapy treatment will generate an increasing work load for the licensing and inspection function in future years.

INCIDENTS ARISING IN 2004

There was generally good compliance by licensees with the regulations and conditions attaching to their use of sources of ionising radiation during 2004. However, a small number of incidents took place during the year.

In April, during the course of an inspection of a church in the North-West, it was discovered that the lightning preventor belonging to the church had disappeared. The preventor contains a radium-226 radioactive source with an activity of 27 megabecquerels. Following

extensive enquires by the local parish priest, two Inspectors from the Regulatory Service safely retrieved the lightning preventor from an area adjacent to a local unauthorised dumpsite. The preventor was appropriately packaged and transferred to another licensee who, in the interest of public safety, agreed to securely store it for the interim. Following this incident the Regulatory Service contacted all other holders of lightning preventors and confirmed that they were all accounted for.

Also in April, two senior industrial radiographers were carrying out gamma radiography on pipe work at an isolated site in Cork. The iridium-192 source that the radiographers were using became stuck and attempts to retract it to the safe shielded position failed. The source had jammed in the wind-out cable of the exposure tube.

In order to make the source safe, the company's radiation protection officer severed part of the exposure tube in which the source was stuck, and transferred it to a shielded transport container using a special handling tongs. A visual inspection of the source holder revealed that cracks in the holder connection assembly contributed to the incident. The supplier of the exposure equipment was notified of this failure. The doses to the radiographers were relatively low (maximum 1.14 mSv). The implementation of effective emergency safety procedures ensured that the consequences of the incident were limited in extent.

Two incidents involving ionising air devices occurred in the latter half of 2004. The first incident involved a company which lost an ionising gun incorporating a polonium-210 radioactive source that is used to remove static electricity in manufacturing environments.

The missing source was most likely inadvertently dispatched to landfill with other items of waste collected by a disposal company. It should not present a hazard due to the increasingly weak radiation level emanating from the source. As a result of the incident, the company was censured by the Regulatory Service.

Following that incident, the Regulatory Service wrote to other holders of such sources. As a consequence, a company in Dublin reported that one of their 22 static elimination devices, an air ionising knife containing polonium-210, was missing. A case arising from this incident is due to come before the courts in September 2005.

LEGAL MATTERS

In January, a manufacturing company was prosecuted in the District Court in Cork City for the unlicensed disposal of a nuclear device (a nickel-63 sealed source in a laboratory based gas chromatograph system), which was subsequently transferred to a local landfill site. The company was convicted under the Radiological Protection Act, 1991, fined €600 and ordered to pay costs.

In April, a pharmaceutical company was prosecuted, also in the District Court in Cork City, for the unlicensed custody of a nuclear device (a nickel-63 sealed source in a portable gas chromatograph system) resulting from a failure to renew their existing licence. The company was fined €1,000 and ordered to pay costs.

In May, a manufacturing company was prosecuted in the Dublin District Court for the unlicensed custody of an X-ray system resulting from their failure to complete the necessary documentation to renew their existing licence. The company was fined €250 and ordered to pay costs.

DEVELOPMENT OF GUIDANCE DOCUMENTS

During 2004, the Medical Radiation Advisory Committee (MRAC) of the Institute developed a guidance document on the administration of radiopharmaceuticals to women who are breast-feeding (RPII 04/1). The purpose of this publication is to provide advice to those involved in nuclear medicine when dealing with patients who are breast-feeding. The Institute also issued a guidance note, developed by the MRAC, to all hospitals with nuclear medicine departments advising them of recommended procedures that should be followed when dealing with cadavers containing significant quantities of recently administered iodine-131. The MRAC also began work on the revision of the Institute's Code of Practice on the Design of Diagnostic Medical Facilities using Ionising Radiation.

INTERVENTION PLANNING

In July 2004, the Institute issued a statutory direction, under S.I. No. 125 of 2000, to 137 licensees to prepare an appropriate intervention plan to deal with a radiological emergency resulting from their practices, which might give rise to a significant hazard to members of the public. The direction was issued to all hospitals with nuclear medicine and/or radiotherapy departments and to industrial practices with six or more sources and to those involved in transportation of radioactive material. The Regulatory Service produced guidance notes to assist licensees in this process. The initiative received very positive feedback and resulted in an 85 % response within the timeframe specified and a full response received after appropriate reminders were issued.

TRANSPORT REVIEW

A review of relevant national legislation was undertaken to clarify the Institute's role and obligations concerning the transport of Class

7 (radioactive) goods by road and rail. Guidance Notes on relevant issues addressed by the UN International Agreement on the Carriage of Dangerous Goods by Road, known as the ADR, were drafted and recommendations for dealing with outstanding transport issues were developed.

HIGH ACTIVITY SEALED SOURCES (HASS) DIRECTIVE

The purpose of this Directive, which was adopted at the end of 2003, is to ensure that all EU Member States have a regulatory structure and appropriate financial management and surveillance systems in place to ensure the safety of high activity and orphan radiation sources. Orphan sources are radioactive sources which have escaped from regulatory control and include, for example, sources which may be found in consignments of imported scrap. Member States have until the 31st December 2005 to transpose this Directive into national legislation. While the existing regulatory structure in Ireland should meet the regulatory requirements of the Directive, the Directive requires Member States to put in place systems for the detection of sources at possible points of entry including ports, airports and in scrap yards. In addition the practical management of disused and orphan sources including their storage will have to be addressed. Member States are also required to ensure that, adequate financial provisions are in place for the management of disused high activity and orphan sources.

The Institute has examined requirements of the Directive and has submitted a report to Government which outlines how these requirements might be implemented.

The Regulatory Service undertook 229 inspections during the year. There was generally good compliance by licensees with the regulations and conditions attaching to their use of sources of ionising radiation.



DOSIMETRY AND CALIBRATION SERVICE



Ionising radiation sources are widely used throughout industry and the health services. The safe use of such sources depends on reliable measurement of ionising radiation levels in workplaces and accurate assessment of doses to individuals. The Dosimetry and Calibration Service offers a wide range of personnel monitoring and instrument calibration services, which are accredited to the international standard ISO 17025 by the Irish National Accreditation Board.

PERSONNEL DOSIMETRY

During 2004, approximately 79,000 dosimeters were supplied by the Service to nearly 1000 clients in Ireland. Some 8000 individuals were monitored. The highest annual whole-body dose recorded in 2004 was 17.3 mSv. This cumulative dose comprised of a number of doses two of which were reportable to the Institute's Regulatory Service. The dose was received by a source handler and was as a result of procedures not being adhered to. This may be compared with the annual whole-body dose limit of 20 mSv for workers exposed to ionising radiation.

Measurable extremity doses were recorded by personnel working in industry, research and hospitals. A hospital physicist received the highest annual extremity dose of 92.4 mSv to her hand. This value may be compared with the annual extremity dose of 500 mSv for workers exposed to ionising radiation.

A significant milestone during 2004 was the introduction of the new extremity TLD service using ring dosimeters. The dosimeter includes a single natural lithium borate element (Panasonic UD807 TLD). The benefits of the new service to customers include the fact that the dosimeter arrives ready to wear and that dosimeters are now issued to named individuals and so a 12 month cumulative dose report is available.



A new extremity TLD service using ring dosimeters was introduced in 2004.

Dosimetry staff continued to make an input in two international groups, the European Radiation Dosimetry Group (EURADOS) and the Personal Radiation Monitoring Group (PRMG), which stimulate collaboration on dosimetry issues in a pan-European context.

INSTRUMENT CALIBRATION

Radiation detection instruments are checked in accordance with the customer requirements for compliance with the relevant manufacturer's specifications by exposing them to radiation of different energies and/or dose rates. A calibration certificate containing the test data is issued to the client. In 2004, some 370 instruments were tested by the Service.

Licensees holding sealed radioactive sources are required to have them tested every two years for leakage. Testing is carried out by wiping the source or its housing and analysing the radioactivity content. In 2004, a total of 570 wipes were checked. None of the wipes contained greater than the allowable quantity of radioactivity as specified in their licence conditions.

The Service continues to be a member of the International Atomic Energy Agency Secondary Standard Dosimetry Network and the Ionising Radiation Metrology Forum. As well as holding accreditation to ISO standard 17025, it also holds the internationally recognised Secondary Standard status.

NUCLEAR SAFETY AND INTERNATIONAL LIAISON



During 2004, Institute staff continued to play an active role in the key international organisations that develop standards and guidance on safety in the use of ionising radiation and nuclear safety. These organisations include the European Union, the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD).

The Institute continued its formal exchange of information on nuclear licensing and safety issues with the Nuclear Installations Inspectorate of the UK Health and Safety Executive and with the UK Environment Agency, which regulates discharges of radioactivity to the environment. The Institute also joined the Department of the Environment, Heritage and Local Government in formal meetings with representatives of UK Government departments and agencies to exchange information on nuclear safety issues. Meetings for the exchange of information also took place with the Northern Ireland Office and with the Environment and Heritage Service, Northern Ireland.

In December 2004, a Bilateral Agreement was signed between the Governments of Ireland and the United Kingdom. The Agreement covers the early notification of accidents and incidents involving any UK nuclear reactor or any nuclear fuel cycle facility and the transport and storage of nuclear fuels, including spent nuclear fuels, or radioactive wastes for which the UK is responsible. Under the Agreement, Ireland would inform the UK of any radiological emergency occurring in Ireland. The Institute is one of the parties to receive notification from the UK authorities under the Agreement.

OSPAR CONVENTION ON THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH EAST ATLANTIC

The Institute is represented on the Radioactive Substances Committee (RSC) of OSPAR and on a number of Working Groups of the Committee. During 2004, in the context of evaluating progress in the implementation of the 1998 OSPAR Strategy with regard to Radioactive Substances, the RSC further developed the concept of baselines for radioactive discharges, concentrations of radioactivity in the environment and radiation doses from non-nuclear industries. The first full evaluation of the extent to which these discharges are being reduced will take place in 2006. Procedures were put in place for the reporting to OSPAR of radioactive discharges from the off-shore oil and gas industry and from the medical sector. The need to report discharges from universities and other educational establishments that use unsealed radioactive sources for research and teaching was also agreed.

Through its monitoring of radioactivity in the Irish marine environment, the Institute will provide the RSC with annual data on concentrations of specific radionuclides in seawater, seaweeds,

fish and shellfish. The Institute's Regulatory Service plays a key role in controlling the discharges of radioactivity from the medical and research sectors and ensuring that Ireland's commitments, published in the "National Plan for the Implementation of the OSPAR Strategy with regard to Radioactive Substances", are met in full.

VISIT TO SELLAFIELD

In September 2004, a delegation of five scientists, led by the Institute's Chief Executive, Dr Ann McGarry, visited the nuclear reprocessing plant at Sellafield. The purpose of the visit was to see at first hand a small number of on-site facilities of particular interest and concern to Ireland and to explore the changing nature of operations at the site. On-site and off-site emergency preparedness was also discussed with representatives of BNFL and of Cumbria County Council. The visit follows an earlier visit in 2000 during which Institute scientists examined safety documentation relating to the storage of high-level liquid waste.

The facilities included as part of the visit were

The redundant Magnox Fuel Storage Pond and Decanning Facility;

The Solid Active Waste Storage Facility;

The Medium Active Concentrate (MAC) Storage Tanks;

The Highly Active Liquor Evaporation and Storage (HALES) Plant;

The Waste Vitrification Facility; and

The Thermal Oxide Reprocessing Plant (THORP).

The Institute has issued a detailed report on the outcome of its visit. The report highlights the complexity and inter-dependency of operations at the Sellafield site and the possibility of increased discharges to the Irish Sea of certain radionuclides in future years. While commercial reprocessing operations are planned to come to an end by 2012, the management of radioactive wastes produced by operations that have now come to an end and the subsequent decommissioning of the site will not be completed until about 2150 and monitoring of both operations and discharges may be necessary over that timescale. The need to ensure a sufficient level of funding so that all decontamination activities and decommissioning operations can be effectively carried-out is seen as a key issue. The Institute also noted that both on- and off-site emergency preparedness arrangements are in place. The exact details of potential accident scenarios were not made available to the Institute for security reasons, and this limits our ability to accurately assess the implications for Ireland of an accident at Sellafield.

NUCLEAR AND RADIATION SAFETY ABROAD

During 2004, the Institute was informed, through the IAEA Information Service, of 32 nuclear incidents abroad. Nine of these incidents involved nuclear power plants, six involved overexposure or potential overexposure of workers to radiation sources and the remainder were associated with loss, theft or mishandling of radiation sources. There were three incidents at nuclear power plants which were rated level 2 on the IAEA International Nuclear Event Scale (INES), indicating that there had been significant failures of safety systems. Two of these occurred in France. At one power plant, problems with the insulation on electric cables used to operate certain motors and valves were reported while at the other there was an anomaly in the recirculation circuits used for emergency cooling. Both these incidents were viewed by the French regulatory authority as being potentially generic problems for French reactors and all operators have been instructed to carry out appropriate checks and make modifications where required. The third level 2 incident occurred in India and involved a reactor trip due to problems with the steam generator. All of the other reported incidents involving nuclear power plants were rated either level 1 or level 0 indicating, respectively, an event outside the authorised operating regime but without significant failure of safety provisions, or an event with no significance for safety.

There were no incidents in the UK which met the IAEA criteria for reporting. However, principally through the reporting mechanisms that have been agreed with the UK's Nuclear Installations Inspectorate (NII) and the Environment Agency, the Institute is aware of nine minor incidents in the UK. Seven such incidents, involving either minor local contamination and/or equipment failure, took place at Sellafield. The incident of most concern was one in which some weakly contaminated scrap was inadvertently removed from the now closed Calder Hall reactor site. The error was quickly identified and the scrap returned to the site. It is understood that appropriate steps have been put in place to prevent a recurrence. In its assessment of the Environmental Statement prepared by BNFL in support of the decommissioning strategies for Calder Hall and for Chapelcross, the Institute, while welcoming the decommissioning of these power stations, had already highlighted the need to ensure that contaminated material is not inadvertently disposed of. This incident, while not in itself serious, underlines the importance of this issue.

In the Institute's Annual Report for 2003, reference was made to the detection of a 'spike' of radioactivity in the cooling jacket of one of the tanks used to store high-level liquid waste at Sellafield. Originally this was thought to be due to cross contamination in the cooling water resulting from a leaking internal cooling coil. However, the Institute has recently been advised by the NII that this is now believed to be due to a microscopic fissure in the tank wall, as a result of stress corrosion of the steel, which has allowed nanolitre quantities of HAL to leak out. Furthermore, a possible spike of activity in the cooling jacket on another tank has recently been detected. While it is not believed that this development compromises the safety of the tanks in the short-term, it provides further evidence that the long-term storage of high-level radioactive waste in liquid form is not sustainable.

There was a minor incident at Bradwell Nuclear Power Station involving a small release of radioactivity from the reactor on the 14 April during insertion of a camera for diagnostic purposes and a small leak of tritium on the 6 June at Hartlepool Nuclear Power Station.

None of the incidents referred to above had direct implications affecting Ireland.

CLOSURE OF CHAPELCROSS REACTORS

In its report for 2003, the Institute welcomed the closure, in March 2003, of the Calder Hall Nuclear reactors, having expressed concerns over many years with regard to their age and vulnerability to terrorist attacks. For the same reasons, the Institute welcomed the decision on 29 June 2004 to stop electricity production at the Chapelcross nuclear power station, in Dumfriesshire, Western Scotland. Chapelcross is similar in design and construction to the nuclear reactors at Calder Hall.

IMPLICATION OF NEW NUCLEAR REACTOR PROGRAMMES

The renewed interest in nuclear power, which is seen by a number of countries as at least a partial answer to meeting their commitments under the Kyoto Protocol on greenhouse gases as well as ensuring security of energy supply, is being followed closely by the Institute. Countries with definitive programmes for additional nuclear power stations include Finland and France and, further afield, China, Japan and India. A decision on whether or not to construct new nuclear reactors in the United Kingdom is expected in the near future.

COMMENTS ON THE DRAFT RECOMMENDATIONS OF INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP)

The ICRP is an international non-governmental body that regularly reviews and updates the science of radiation and radiation protection and issues recommendations based on its findings. The recommendations of the ICRP are generally used as the basis of international and national legislation. The most recent ICRP recommendations, published in 1990, formed the basis of Council Directive 96/29/EURATOM which is implemented in Ireland through the Radiological Protection Act, 1991, (Ionising Radiation) Order, 2000, S.I. No. 125 of 2000.

During 2004, the ICRP published new draft revised recommendations and invited comments on these proposals. In light of the important role ICRP plays in shaping new legislation, the Institute gave careful consideration to the proposed recommendations. In common with other national regulatory agencies, the Institute contributed to the consultation process and submitted its comments.

The Institute welcomed the new scientific information in the draft recommendations, but pointed out that the new proposals required further clarification to demonstrate the improvements to the present framework of radiological protection. The Institute's comments can be viewed in full on the ICRP website www.icrp.org.

INTERNATIONAL CO-OPERATION AND ASSISTANCE

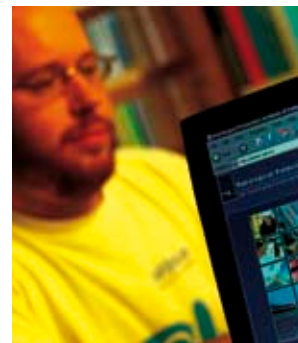
Throughout 2004, staff continued to represent the Institute and Ireland on international committees and at scientific meetings in Ireland and abroad. The international organisations with whom the Institute has a close working relationship include the International Atomic Energy Agency (IAEA), the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD) and the European Commission.

The Institute also made staff and resources available to the IAEA to validate its new Regulatory Authority Information System (RAIS) database; to assess compliance with regulations on the Safe Transport of Radioactive Material under its transport safety appraisal (TRANSAS) mission in France; and provided training, under the Agency's Technical Co-operation Programme, to assist the Cypriot State Laboratory meet the environmental and food monitoring requirements of the European Commission.



In September 2004 a delegation from the Institute visited the nuclear reprocessing plant at Sellafield.

LIBRARY AND INFORMATION SERVICE



The Institute's library and information service supports the Institute's document and reference needs and is open to all, offering a range of information specialising in radiological protection and nuclear safety.

The Institute gives high priority to the promotion of its activities and closely co-operates with the media, who play a significant role in disseminating information and in reporting on radiological protection issues of public concern. Media interest in nuclear issues continued during the year with staff participating in around 30 television and radio programmes around the country. This resulted in widespread coverage of the Institute's activities particularly in relation to radon gas.

The Institute's website (www.rpii.ie) is a resource for information on the Institute and its activities and was regularly accessed during the year with an average of over 3200 unique visitors each month. Popular areas of the site include radon maps, general information on radon, publications, press releases, and emergency planning information. A review of the website's educational content was carried out during the year resulting in additional educational material being developed which is undergoing final review by a communications expert.

In November, the Institute commissioned research to measure awareness of the RPII and its activities. The research found that spontaneous awareness of the Institute is at a modest level of 2%. This rose to over 25% when prompted. However, it also found that the population is reasonably well aware of the issues surrounding radioactivity. Over 75% of those interviewed were aware of radon gas with TV (34%) and newspapers/magazines (29%) the main sources of information.

During 2004, the Institute initiated a programme of work to develop and implement a records management strategy to ensure that practices are effectively meeting the Institute's records management needs. The services of external consultants were engaged to advise the Institute on these matters.

Institute staff regularly participated in information activities including conferences, seminars and exhibitions at a national level and when requested provided speakers for public meetings, and for specialist courses at third-level institutions, hospitals and elsewhere. Tours of the Institute's facilities and laboratories were also given to interested groups of visitors.

The Institute provides the Irish Liaison Officer for the IAEA's International Nuclear Information System (INIS) which provides a database of publications related to nuclear science and its peaceful applications. Items relevant to the database and published in Ireland are input to the system using software supplied by the IAEA and the data is sent using electronic mail.

Publishing activities included the production of an updated brochure on radon and a booklet on radon remediation which details the types of remediation solutions available and assists householders in deciding how best to deal with the problem. All RPII reports are made available free of charge on its website.

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** RPII staff in conjunction with other authors.*

FINANCIAL STATEMENTS

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FINANCIAL STATEMENTS

Report of the Comptroller and Auditor General for presentation to the Houses of the Oireachtas

I have audited the financial statements on pages 28 to 36 under Section 16 of the Radiological Protection Act, 1991.

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

The accounting responsibilities of the Members of the Institute are set out on page 29. It is my responsibility, based on my audit, to form an independent opinion on the financial statements presented to me and to report on them.

I review whether the statement on the system of internal financial control on page 28 reflects the Institute's compliance with applicable guidance on corporate governance 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.

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 auditing standards 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 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 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, proper books of account have been kept by the Institute and the financial statements, which are in agreement with them, give a true and fair view of the state of affairs of the Institute at 31 December 2004 and of its income and expenditure for the year then ended.



Gerard Smyth

For and on behalf of the
Comptroller and Auditor General
15 July 2005

STATEMENT ON THE SYSTEM OF INTERNAL FINANCIAL CONTROL

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 environment by

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

In 2003, 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.

In 2003 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 on 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. With effect from 2004, a feature of this has been the provision to the Board of 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 2004 the Board had conducted a review of the effectiveness of the system of internal financial controls.

Signed on behalf of the Board



FJ Mulligan
Chairman
8 June 2005

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.

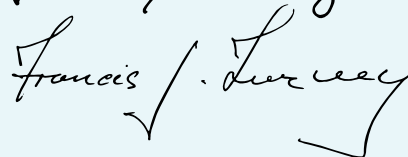
The Institute is responsible for keeping proper books of accounts which disclose with reasonable accuracy at any time the financial position of the Institute and which enable it to ensure that the financial statements comply with Section 16 (1) of the Act.

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.

Chairman



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.

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

A Superannuation Scheme under Section 14 of the Nuclear Energy (An Bord Fuinnimh Nuicleigh) Act, 1971 was in operation up to March 1992. A new scheme has been drawn up in accordance with the provisions of Section 13 of the Radiological Protection Act, 1991 and is awaiting final approval. Contributions were credited against salaries. No provision has been made in the Financial Statements in respect of future superannuation liability. Superannuation benefits are met from revenue as they arise.

5. Capital Account

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

6. Contract Income

Contract Income includes amounts received from the European Community under contracts for fixed periods. Amounts received under these contracts have been treated as deferred credits, and released as income proportionately over the lives of the related contracts.

7. Income in Advance

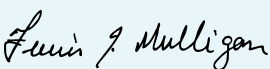
Income in advance relates to licence fee income paid in advance by licensees in respect of future periods.


INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 DECEMBER 2004

2003 €		2004 €
	INCOME	
3,068,000	Oireachtas Grant	3,310,000
(33544)	Transfer to Capital Account (Note 2)	(69,156)
<u>3,034,456</u>		<u>3,240,844</u>
396,959	Dosimetry	420,961
253,968	Product Certification	300,357
93,261	Contract Income	27,914
135,768	Licence Fees	130,016
151,557	Other Income	439,842
<u>1,031,513</u>		<u>1,319,090</u>
<u>4,065,969</u>		<u>4,559,934</u>
	EXPENDITURE	
2,333,716	Salaries and Pensions (Note 3)	2,579,416
171,937	Dosimetry & Regulatory Service	206,326
74,104	Library & Information Service	95,391
47,207	Radon	87,390
55,309	Emergency Plan	48,427
105,778	Environmental Monitoring	117,862
451,943	Accommodation & Insurance (Note 4)	515,824
134,635	Travel and Subsistence	143,189
156,572	Telephone, Postage, Office Supplies & IT	138,404
72,221	Recruitment and Training	96,131
40,659	Miscellaneous including Professional Fee	164,944
12,950	Audit Fees	11,950
326,970	Depreciation	356,478
<u>3,984,001</u>		<u>4,561,732</u>
81,968	SURPLUS/(DEFICIT) FOR YEAR	(1,798)
<u>331,963</u>	Balance at 1st January	<u>413,931</u>
<u>413,931</u>	Balance at 31st December	<u>412,133</u>

The Institute has no gains or losses in the financial year or the preceding financial year other than those dealt with in the Income and Expenditure Account. The results of the year relate to continuing operations.

The Statement of Accounting Policies and notes 1 to 8 form part of these Financial Statements.

Chairman:  8 June 2005

Board Member:  8 June 2005

BALANCE SHEET AS AT 31ST DECEMBER 2004

2003 €		Notes	2004 €
1,053,075	FIXED ASSETS	1	1,122,231
	CURRENT ASSETS		
510,318	Cash on Hand & at Bank		332,746
272,645	Debtors & Prepayments		425,523
<u>782,963</u>			<u>758,269</u>
	CREDITORS - amounts falling due within one year		
256,336	Creditors & Accruals		266,148
112,696	Income in Advance		79,988
<u>369,032</u>			<u>346,136</u>
<u>413,931</u>	NET CURRENT ASSETS		<u>412,133</u>
<u>1,467,006</u>	NET ASSETS		<u>1,534,364</u>
	Financed by:		
413,931	INCOME & EXPENDITURE ACCOUNT		412,133
<u>1,053,075</u>	CAPITAL ACCOUNT	2	<u>1,122,231</u>
<u>1,467,006</u>			<u>1,534,364</u>

The Statement of Accounting Policies and Principles and notes 1 to 8 form part of these Financial Statements

Chairman: *Kevin J. Mulligan* 8 June 2005

Board Member: *Francois J. Lucey* 8 June 2005

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31ST DECEMBER 2004

1. Tangible Fixed Assets

	Leasehold Improvements €	Office and Laboratory Furniture and Equipment €	Total €
Cost:			
At 1st January 2004	788,301	4,132,790	4,921,091
Additions	0	425,635	425,635
Disposals	0	(326,311)	(326,311)
At 31st December 2004	<u>788,301</u>	<u>4,232,114</u>	<u>5,020,415</u>
Depreciation:			
At 1st January 2004	404,079	3,463,938	3,868,017
Charge for year	25,617	330,861	356,478
On disposals	0	(326,311)	(326,311)
At 31st December 2004	<u>429,696</u>	<u>3,468,488</u>	<u>3,898,184</u>
Net Book Value at			
31st December 2003	<u>384,222</u>	<u>668,853</u>	<u>1,053,075</u>
Net Book Value at			
31st December 2004	<u>358,605</u>	<u>763,626</u>	<u>1,122,231</u>

During 2004, the Institute reviewed its Register of Fixed Assets and removed items originally costing €326,311 which were fully depreciated and no longer in use.

2. Capital Account

	2004 €
Balance at 1st January 2004	1,053,075
Transfer from Income and Expenditure Account	
Grants allocated for Capital Purposes	425,635
Grants amortised in year	<u>(356,479)</u>
Balance at 31st December 2004	<u>69,156</u> <u>1,122,231</u>

3. Salaries And Pensions

	2004 €	2003 €
Gross Salaries	2,623,336	2,367,980
Employers P.R.S.I.	104,778	94,065
Pension Deductions	(148,698)	(128,329)
	<u>2,579,416</u>	<u>2,333,716</u>
Breakdown of Salaries and Pensions		
Administration	527,759	446,212
Regulation/Dosimetry/Licensing	765,863	615,747
Environmental Monitoring	530,247	516,872
Information/Radon/Radioecology	492,216	452,265
Emergency Plan	213,746	252,219
Nuclear Safety	49,585	50,401
Charged to Income & Expenditure Account	<u>2,579,416</u>	<u>2,333,716</u>

The average number of full-time persons employed, excluding Board members, in the financial year was 46 (2003 - 45).
Pension payments amounted to €151,552 (2003 - €136,502).

4. Commitments & Lease Obligations - Operating Leases

3 Clonskeagh Square

Lease commitments payable in the next twelve months amount to €270,000 on the basis of current rental rates and comprise rental payments on a leasehold interest, the term of which expires on 1 October 2018.

The rental is subject to review at five-yearly intervals. The last such review was 1 October 2003.

Floor 1, Block 1, 1 Clonskeagh Square

Lease commitments payable in the next twelve months amount to €17,500 on the basis of current rental rates and comprise rental payments on a leasehold interest, the term of which expires on 16 February 2007.

5. Capital Commitments

The value of capital commitments authorised at 31 December 2004 amounted to €66,420.

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 Board's activities in which the Board members had any beneficial interest.

7 FRS 17 Retirement Benefits

For the accounting periods on or after 1 January 2005, Financial Reporting Standard 17 (FRS 17) will require financial statements to reflect at fair value, the assets and liabilities arising from an employer's superannuation obligations and any related funding, and to recognise the costs of providing superannuation benefits in the accounting periods in which they are earned by employees. As a transitional measure for accounting periods ending on or after 22 June 2001, the Standard requires that the present value of scheme liabilities be disclosed as a note to the accounts.

The financial assumptions used to calculate the retirement liabilities under FRS17 at 31 December 2004, were as follows:

Valuation Method:	Projected Unit:
Discount Rate	4.50 %
Inflation Rate	2.25 %
Salary Increases	4.00 %
Pension Increases	4.00 %

The pension plan is unfunded and thus does not hold any assets.

	Market Value at 31 December 2004
	€000
Total market value of assets	0
Present value of pension scheme liabilities	12,228
Net surplus/(deficit) in pension scheme	(12,228)
Net pension liability	(12,228)

The financial assumptions used to calculate the components of the defined benefit cost for the year ended 31st December 2004, were as follows:

Valuation Method:	Projected Unit:
Discount Rate	5.25%
Inflation Rate	4.00%
Salary Increases	4.00%
Pension Increases	4.00%

Analysis of the amount charged to operating profit is as follows:

Current Service Cost	330
Past Service Cost	0

Analysis of the amount credited to other finance income is as follows:

Interest on scheme liabilities	491
Expected return on scheme assets	0

Analysis of the amount recognised in statement of total recognised gains and (losses) is as follows:

Actual return less expected return on scheme assets	0
Experience gains and losses	(427)
Changes in assumptions	(1,806)
Actuarial gain/(loss) recognised in STRGL	(2,233)

Analysis of the amount recognised in statement of total recognised gains and (losses) is as follows:

Surplus/(deficit) at beginning of year	(9,174)
Current service cost	(330)
Contributions	0
Past service costs	0
Other finance income	(491)
Actuarial gain/(loss)	(2,233)
Surplus/(deficit) at end year	(12,228)

8 Approval of Financial Statements

The financial statements were approved by the Board on 8 June 2005.