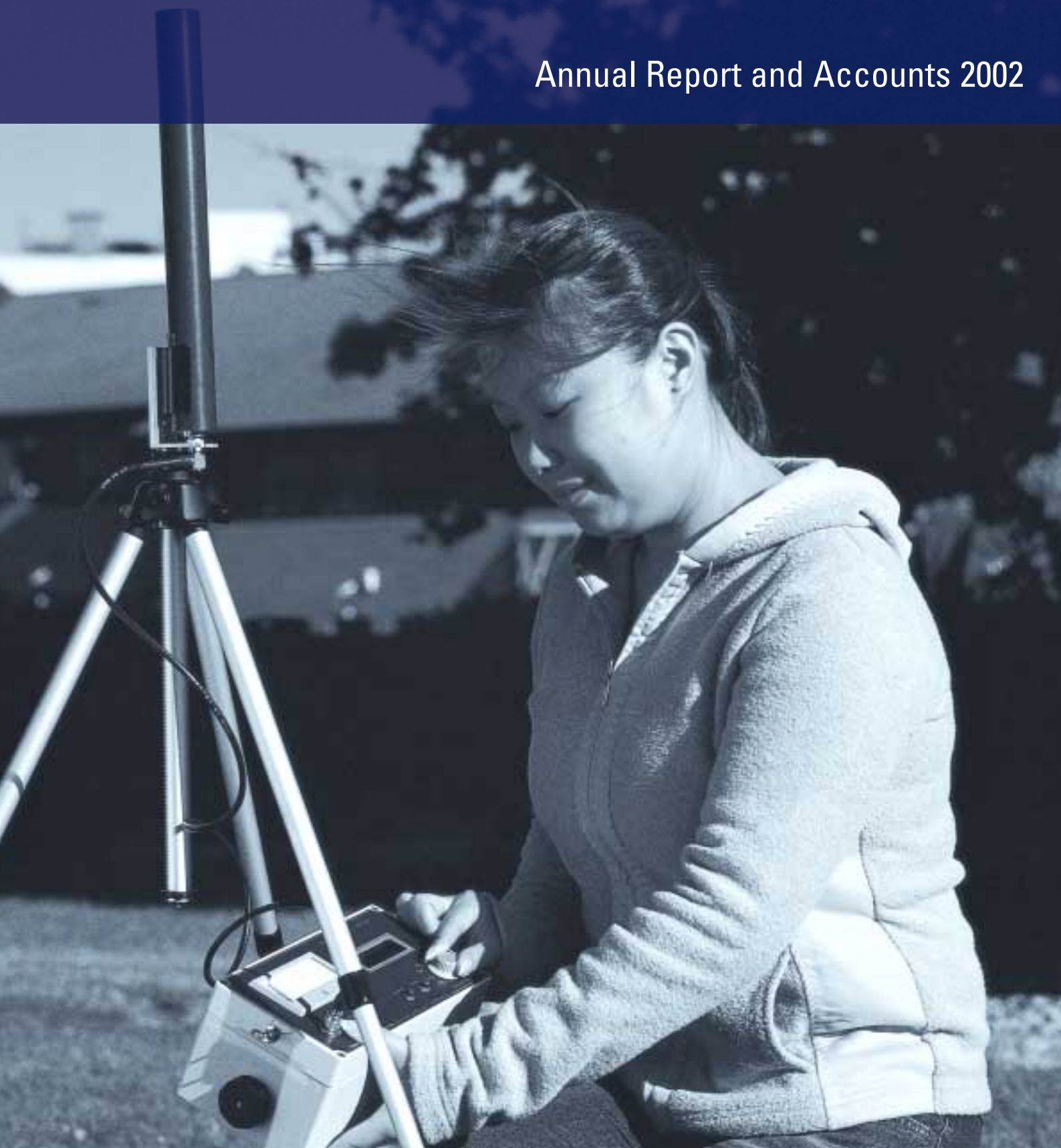




Radiological Protection Institute of Ireland
An Institiúid Éireannach um Chosaint Raideolaíoch

Annual Report and Accounts 2002



RADIOLOGICAL PROTECTION INSTITUTE OF IRELAND

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 2002.

Francis J Mulligan, Chairman

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Chairman's Statement

I am pleased to introduce the Annual Report and Accounts of the Radiological Protection Institute of Ireland for 2002, a year which saw many changes in the Institute.

Radon is the dominant source of exposure to ionising radiation for the Irish population and on average accounts for more than 60% of the total exposure to an Irish person. Exposure to radon occurs in the home, in schools and in workplaces. The implementation of legislation introduced in 2000 to control exposure to radon and other natural radiation sources in the workplace continues to be an important area of the Institute's work. The response to the Institute's pilot campaign directing employers to measure radon in their workplaces was poorer than expected and follow up actions are now being pursued to improve employers' awareness of their responsibilities in this regard. The programme of measurement of radon in schools is largely complete and work to reduce the radon levels in those schools with one or more classrooms above the Reference Level is well advanced. The programme of remedial works, when completed, will give effect to a significant reduction in the overall exposure of pupils and teachers.

By comparison, the response to various initiatives by the Institute over a number of years to encourage householders to measure radon in their homes has been disappointing and to date less than 3% of the total number of homes predicted to be above the Reference Level of 200 Bq/m³ have actually been identified. The number of householders actually undertaking work to reduce high radon levels is an even smaller percentage of this number. This situation is of serious concern to the Institute, particularly in light of the recent identification in County Kerry of a radon level in a house of more than 200 times the Reference Level. While the apathy surrounding the risk posed by exposure to

radon in the home is mirrored in other European countries, the percentage of the population likely to be affected in Ireland is among the highest in Europe and, for this reason, the Institute will continue to seek out new ways of getting its message across.

The Institute's role in providing advice to Government on matters relating to nuclear safety continued to be a high priority during the year with a number of significant developments at the international level, and more particularly, the legal actions by the Government against the MOX plant at Sellafield. One very positive development was the announcement by British Nuclear Fuels Ltd that it was bringing forward the closure date of the Calder Hall reactors on the Sellafield site, to March 2003. These reactors were the oldest of the Magnox type reactors still in active service in the UK and the fact that they have now ceased operation eliminates their potential to pose a significant risk to Ireland. The programme of planned Magnox reactor closures set out by the UK Nuclear Industry, in which all such reactors are due to close by 2010, will continue to be monitored closely by the Institute.

In considering the potential for the activities at Sellafield to harm the environment of Ireland, the primary concern of the Institute continues to be the safety of the storage of liquid high-level radioactive waste in holding tanks on the site. While measures are being taken to address the recommendations contained in the Institute's report on the safety of these tanks published in 2000, the Institute continues to monitor developments both in relation to BNFL's Safety Case for the operation of the tanks and, in particular, the implementation of its plans, which have been agreed with the UK nuclear regulator, to significantly reduce the volume of waste stored in these tanks by 2015.

In relation to its role in the response to a nuclear incident abroad, the Institute has given significant priority to the further development of the National Emergency Plan for Nuclear Accidents. In relation to the Plan as a whole, the Institute has worked closely with other agencies involved, in particular with the Department of Environment, Heritage and Local Government. In my view it is essential that major exercises of the Plan be carried out at least once every four years to ensure that all elements of the Plan continue to operate effectively. Individual elements of the Plan should continue to be tested on a more frequent basis.

I warmly welcome the passage into law of the European Communities (Medical Ionising Radiation Protection) Regulations, 2002 that govern the protection of patients, and others, undergoing radiation exposure for medical purposes. The Institute will work closely with the Department of Health and Children and the Medical and Dental Councils to ensure that its responsibilities in relation to the use of ionising radiation for medical purposes are discharged in such a way as to complement the new regulations.

I wish to express my sincere thanks and that of my fellow Board members to Dr Tom O'Flaherty who retired as Chief Executive of the Institute on the 30th April 2002.

Dr O'Flaherty joined the Nuclear Energy Board (NEB), the forerunner to the Institute, in 1990 and was appointed as Chief Executive of the Institute following its establishment in 1992. The Institute is deeply indebted to Dr O'Flaherty for his valuable contribution to the Institute during its formative years. I look forward to working with the new Chief Executive, Dr Ann McGarry.

I wish to record my own thanks and that of the Institute to Ms Mary Coffey who retired from the Board on the 31st of March 2003, having served a five-year term. I welcome Professor Kieran Byrne to the Board in her place.

I wish to record my appreciation of the dedication and expertise, which has at all times characterised the work of the Institute's staff. I wish also to acknowledge the contributions of the members of the Institute's Advisory Committees who give their time voluntarily to assist the Institute in its work.

Finally I wish to record the Institute's appreciation for the support received from the Minister for the Environment, Heritage and Local Government, Mr Martin Cullen TD. It is also a pleasure to acknowledge the co-operation received at all times from the officials of the Nuclear Safety Section of DOEHLG, as well as assistance received from other Government departments, national organisations and from third-level institutions.



Francis J Mulligan
Chairman

Ráiteas An Chathaoirligh

Tá áthas orm Tuarascáil agus Cuntais Bhliantúil An Institiúid Éireannach um Chosaint Raideolaíoch do 2002, bliain inar tharla go leor athruithe san Institiúid, a chur i láthair.

Radón an foinse nochtaithe is mó de radaíocht ianaíoch i measc dhaonra na hÉireann agus ar an meán 60% de nochtadh iomlán an duine aonair in Éirinn is de bharr radóin é. Tarlaíonn nochtadh radóin sa bhaile, i scoileanna agus ar láithreacha oibre. Tá feidhmiú na reachtaíochta a tugadh isteach i 2002 chun nochtadh do radón agus d'fhoinsí nádúrtha radaíochta eile a rialú sa láthair oibre fós tábhachtach in obair na hInstitiúide.

Ní raibh an freagra i leith fheachtas píolótach na hInstitiúide, a bhí dírithe ar fhóistoirí, chun radón i láithreacha oibre a thomhas chomh maith agus ceapadh a bheadh sé agus tá gníomhartha chun cur le heolas fóistoirí maidir lena bhfreagrachtaí ina leith sin á leanúint. Tá an clár chun radón i scoileanna a thomhas tugtha chun críche don chuid is mó agus tá an obair chun leibhéil radóin i scoileanna a bhfuil seomra ranga nó níos mó os cionn an Leibhéil Tagartha go maith chun cinn. Tabharfaidh an clár d'oibreacha leasúcháin, nuair a bheidh sé tugtha chun críche, éifeacht do laghdú suntasach nochtadh foriomlán daltaí agus múinteoirí.

I gcomparáid leis sin arís bhíodhas díomach maidir leis an bhfreagra ar thionscnaimh éagsúla na hInstitiúide thar roinnt blianta chun líonta tí a spreagadh an radón ina dtithe a thomhas agus go dáta níl fiú 3% den líon iomlán tithe a bhfuil sé tuartha iad a bheith os cionn an Leibhéil Tagartha de 200 Bq/m³ aitheanta. Tá an céadtadán de na líonta tí atá ag tabhairt faoi na hoibre chun leibhéil radóin arda a laghdú ar chéadtadán níos lú arís den uimhir sin. Is cúis mhór imní é seo don Institiúid go háirithe ó fuarthas amach le deireanaí go bhfuil teach i gCo Chiarraí a bhfuil an leibhéil radóin os cionn 200 uair an Leibhéil Tagartha. Cé go bhfuil an imní chéanna i dtíortha eile na hEorpa maidir leis an mbaol a bhaineann le nochtadh radóin i dtithe cónaithe tá an baol ann go bhfuil an céadtadán den daonra a mbeidh tionchar ag nochtadh radóin orthu in Éirinn ar an gcéadtadán is airde san Eoraip agus, mar gheall air sin, féachfaidh an Institiúid le bealaí nua a aimsiú chun a teachtaireacht a chur in iúl.

Bhí tosaíocht ard i rith na bliana ag an ról atá ag Institiúid comhairle a sholáthar don Rialtas ar nithe a bhaineann le sábháilteacht núicléach agus rinneadh roinnt forbairtí suntasacha ag an leibhéal idirnáisiúnta agus ach go háirithe gníomhartha dlí an rialtais in aghaidh monarcha MOX i Sellafield. Forbairt dhearfach amháin ab ea fógra ón British Nuclear Fuels Ltd go raibh sé ag tabhairt dáta dúnta imoibreoirí Calder Hall ar shuíomh Sellafield chun cinn go Márta 2003. Bhí na himoibreoirí sin ar na himoibreoirí ba shine de chineál imoibreoirí Magnox a bhí i seirbhís ghníomhach sa RA agus anois go bhfuil deireadh curtha lena n-úsáid tá deireadh curtha leis an mbaol suntasach a bhí iontu d'Éirinn. Leanfaidh an Institiúid ag déanamh monatóireacht ghéar ar an gclár atá leagtha amach ag an UK Nuclear Industry chun imoibreoirí Magnox a dhúnadh.

Agus an baol atá ann go ndéanadh gníomhaíochtaí i Sellafield dochar do thimpeallacht na hÉireann á bhreithniú is é príomhimní na hInstitiúide fós ná go mbeadh na tancanna atá ar an suíomh ina bhfuil leacht dramhaíola atá ar leibhéal ard radghníomhach stóraithe iontu sábháilte. Cé go bhfuil bearta á nglacadh chun tabhairt faoi mholtaí atá i dtuarascáil na hInstitiúide ar shábháilteacht na dtancanna sin agus a foilsíodh i 2000, leanann an Institiúid freisin

ag déanamh monatóireachta ar fhorbairtí maidir le Cás Sábháilteachta BNFL d'oibriú na dtancanna agus, ach go háirithe, feidhmiú na bpleananna atá aontaithe le rialóir núicléach an RA, chun an méid dramhaíola atá stóraithe sna tancanna sin a laghdú go suntasach faoi 2015.

Maidir lena ról i bhfreagra ar eachtraí núicléacha thar lear tá tosaíocht shuntasach tugtha ag an Institiúid an Plean Náisiúnta Éigeandála do Thimpistí Núicléach a fhorbairt tuilleadh. Maidir leis an bplean ar an iomlán, d'oibrigh an Institiúid go dlúth le gníomhaireachtaí eile a bhí páirteach go háirithe an Roinn Comhshaoil, Oidhreacht agus Rialtais Áitiúil. I mo thuairimse tá sé riachtanach mórchleachtadh a dhéanamh ar an bPlean ar a laghad uair gach ceithre bliana chun a chinntiú go leanfaidh gach gné den Phlean ag feidhmiú go héifeachtach. Ba chóir leanúint ag déanamh tástála ar ghnéithe aonair den Phlean níos minicí.

Fáiltím go mór roimh Rialacháin na gComhphobal Eorpach (Cosaint Radaíochta Ianaíoch Leighis) 2002 a achtaíodh i ndlí agus a rialaíonn cosaint othar agus eile atá ag tabhairt faoi nochtadh radaíochta ar mhaithe le críocha leighis. Oibreoidh an Institiúid go dlúth leis an Roinn Sláinte agus Leanaí agus le Comhairlí Déada agus Leighis chun a chinntiú go bhfuil a freagrachtaí i leith úsáid radaíochta ianaíoch do chríocha leighis á gcomhlíonadh ar bhealach a thagann leis na rialacháin nua.

Ba mhaith liom buíochas ó chroí a ghlacadh thar mo cheann féin agus thar ceann chomhaltaí an Bhoird leis an Dr Tom O'Flaherty a d'éirigh as mar Phríomhfheidhmeannach na hInstitiúide an 30ú Aibreán 2002. Bhí an Dr O'Flaherty ina bhall den Bhord Fuinnimh Núicléach (NEB), a bhí ann roimh an Institiúid, ó 1990 agus ceapadh é mar Phríomhfheidhmeannach na hInstitiúide nuair a bunaíodh é i 1992. Tá an Institiúid go mór faoi chomaoín ag an Dr O'Flaherty as an gcúnamh luachmhar a thug sé don Institiúid le linn a blianta bunaidh. Táim ag tnúth le bheith ag obair leis an bPríomhfheidhmeannach nua, an Dr. Ann McGarry.

Ba mhaith liom buíochas a ghlacadh freisin thar mo cheann féin agus thar ceann na hInstitiúide le Mary Coffey Uasal a d'éirigh as an mBord an 31 Márta 2003 tar éis téarma cúig bliana. Fáiltím roimh an Ollamh Kieran Byrne a ghlac a háit ar an mBord.

Ba mhaith mo mheas a léiriú ar shaineolas agus ar thiomantas fhoireann na hInstitiúide a raibh an saineolas agus an tiomantas sin i gcónaí soiléir ina gcuid oibre. Ba mhaith liom aitheantas a thabhairt don obair ar fad a rinne comhaltaí Choistí Comhairleacha na hInstitiúide a rinne obair dheonach chun cuidiú leis an Institiúid ina cuid oibre.

Ar deireadh ba mhaith liom buíochas a ghlacadh thar ceann na hInstitiúide as an tacaíocht a fuarthas ón Aire Comhshaoil, Oidhreacht agus Rialtais Áitiúil, an tUasal Martin Cullen, TD. Is mór agam freisin an comhoibriú a fhaighimid i gcónaí ó oifigigh na Roinne Sábháilteachta Núicléach den DOEHLG chomh maith leis an gcúnamh a fhaightear ó ranna Rialtais eile, eagraíochtaí náisiúnta agus institiúidí tríú leibhéal.



Francis J Mulligan
Cathaoirleach

Staff Structure



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 license 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.

Members of the Board

On 31st March 2002 the terms of office of Mr Gregory Burke, Mr James Gibney and Dr Lesley Malone expired. Mr Burke and Dr Malone were re-appointed to the Board with effect from 18th April 2002. Mr James Fitzmaurice was appointed to the Board with effect from 18th April 2002.

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. In the case of the six members who were nominated for appointment to the Board by particular organisations, the names of the respective nominating organisations are also shown.

Chairman	Francis J Mulligan	8(8)
	William Blunnie	5(8)
	Medical Council	
	Gregory Burke	8(8)
	Institute of Food Science and Technology of Ireland	
	Mary Coffey	6(8)

Patrick Connellan	5(8)
Dental Council	

Anita Dowling	5(8)
Association of Physical Scientists in Medicine	

Edward Fitzgerald	4(8)
Faculty of Radiologists RCSI	

James Fitzmaurice	4(5)
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James Gibney	1(2)
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Lesley Malone	5(8)
Irish Nuclear Medicine Association	

Darina Muckian	7(8)
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Adi Roche	3(8)
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Francis J Turvey	7(8)
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On 21st February 2003 the term of office of Ms Mary Coffey expired. Professor Kieran Byrne was appointed to the Board with effect from 24th February 2003.

Main Developments

Natural Radioactivity

The Institute further expanded its programme to evaluate the risk of exposure of the population to radon to include a pilot study of radon in drinking water in County Wicklow. Attention had been focused on this issue by a European Commission recommendation in 2001 that proposed that surveys should be undertaken in Member States to determine the scale and nature of exposures caused by radon in domestic drinking water supplies. The study concluded that, while the number of households likely to be affected was small, radon in drinking water may pose a significant additional health risk, in the longer term, to some consumers who depend on a private groundwater supply as their primary source of water.

Work by the Department of Education and Science on the reduction of radon levels in schools identified by the nationwide survey undertaken between 1999 and 2001, progressed significantly. By the end of the year, post remediation measurements had been undertaken in 97 schools with the results indicating that the work undertaken had been successful in reducing the radon concentration. An increase in ventilation was found to reduce radon concentrations by an average of 47% while the corresponding figure where sumps had been installed was 81%.

For those at work, exposure to natural radioactivity sources, including radon, can also be of concern. Effort was concentrated on the control of exposure to radon in underground workplaces and on the exposure of aircrew to cosmic radiation. In both situations, the majority of workers received radiation doses of between 1 and 4 millisieverts with a small number receiving higher

exposures. The Institute continues to monitor the situation to ensure that doses are kept as low as reasonably achievable.

Regulation of the Uses of Ionising Radiation

Significant progress was made on the introduction of a Quality Management System by the Regulatory Service. This development is particularly important in light of the increase in the number of licensees, and the need to ensure that the efficiency and effectiveness of the licensing system are maximised, in line with the recommendations of a peer review undertaken by the International Atomic Energy Agency. Greater emphasis was placed on assessing the safety aspects of licensees' activities and in particular, inspections of industrial radiography practice are now carried out on site while radiography is actually being performed.

A welcome development was the coming into force of the European Communities (Medical Ionising Radiation Protection) Regulations, 2002 governing the protection of patients, and others, undergoing radiation exposure for medical purposes. While the Institute has no direct role in enforcing these regulations, the introduction of the legislation complements the regulations governing the Institute's activities and completes the framework for this type of exposure. In this context, the Institute assisted in the organisation of an international conference on medico-legal exposures that provided a forum to discuss the ethical, legal, social and technical problems encountered with these practices.

Radioactivity in the Environment

A further development in determining the dose to individuals from radioactivity in foodstuffs was the commencement of a new programme of measurement of radioactivity in the typical Irish diet and in specific ingredients, undertaken in collaboration with the Food Safety Authority of Ireland. The results of this programme will allow a more accurate evaluation of the exposure of the Irish population to radioactivity, of both natural and artificial origin in foodstuffs.

Emergency Planning

Work continued towards further development of the National Emergency Plan for Nuclear Accidents. In particular a wide-ranging review of the network of fixed monitoring stations designed to provide both an early alerting system in the event of an incident at a nuclear facility abroad and information concerning the actual extent of contamination, was undertaken. The review indicated the need to substantially upgrade some of the monitoring equipment and to increase station density along the eastern and southern coastlines. It also recommended that an airborne monitoring capability be established. A proposal in this regard has been forwarded to the Department of Environment, Heritage and Local Government for consideration. The establishment of robust emergency information management arrangements was also progressed through a review of the information flow in an emergency both within the Institute and with external agencies.

International Developments

A significant development was the announcement by British Nuclear Fuels Ltd that it was bringing forward the closure date of the Calder Hall reactors on the Sellafield site to March 2003. The Institute had expressed concern on a number of occasions about the continued operations of these reactors given their age, lack of secondary containment and apparent vulnerability to terrorist attack.

Towards the end of the year, the European Commission proposed two new Directives aimed at the implementation of a Community approach to nuclear safety, from the design of a nuclear installation to its decommissioning including the management of radioactive waste.

The first Directive sets out basic obligations and general principles on the safety of nuclear installations. If agreed, this Directive will oblige all Member States with nuclear facilities to establish an independent and adequately resourced regulatory authority and to ensure that adequate financial resources are made available to support the safety of nuclear installations and to cover decommissioning costs.

The second Directive deals with the management of spent fuel and radioactive waste. If agreed, this Directive will oblige all Member States to make suitable arrangements for the long-term management of radioactive waste. It will also oblige non-nuclear Member States, including Ireland, to make arrangements for the management of their radioactive waste within prescribed timescales.

Staff and Resources

Staff

A major development during the year was the retirement, at the end of April 2002, of Dr Tom O'Flaherty as Chief Executive of the Institute. Dr O'Flaherty joined the Nuclear Energy Board (NEB), the forerunner to the Institute, in 1990 having served as a Board member between 1982 and 1987. In 1992, the NEB was replaced by the RPII and Dr O'Flaherty was appointed as its first Chief Executive. Dr Ann McGarry replaced Dr O'Flaherty as Chief Executive with effect from May 2002. Dr Barbara Rafferty was appointed to the senior management post left vacant by Dr McGarry's promotion. Consequential vacancies at Senior Scientific Officer and Scientific Officer grades were also filled.

The sanction which was granted to recruit an experienced medical physicist to the staff of the Regulatory Service, resulted in the position of Head of Regulatory Service being advertised in August 2002. Although suitable candidates were identified, all declined the offer, mainly citing the cost of living in Dublin as the principal impediment.

In October 2002, the Institute agreed to the secondment of Dr Tom Ryan as a national expert to the European Commission's Directorate General Environment, based in Luxembourg. During his two year secondment, commencing in January 2003, Dr Ryan joins the staff of the Radiation Protection Unit and his main area of responsibility is the development of a strategy on levels of radioactivity in the environment.

Equality

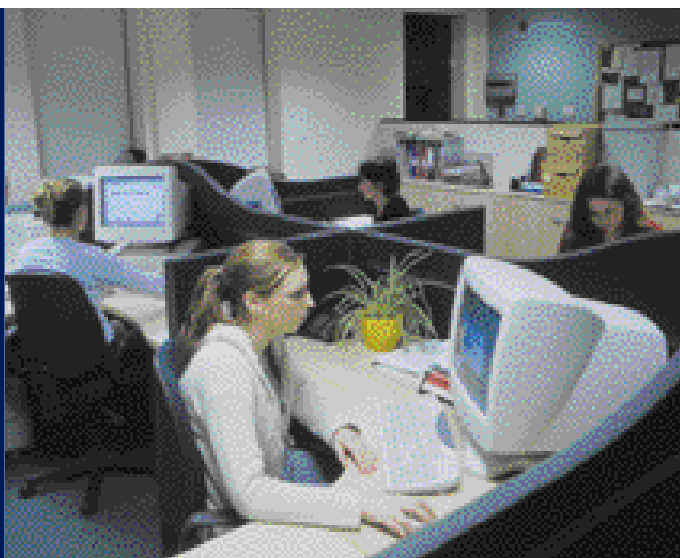
The Institute is committed to a policy of equal opportunity in all aspects of its activities. Particular attention is given to equality in recruitment, conditions of employment and access to promotion, training and career development. The Institute recognises that flexible working arrangements are an important component of equality policies and operates such schemes as flexitime, study leave, career breaks and work-sharing.

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 2002, it played an important role in meeting the requirements of the Modernisation Programme, which is provided for under the Programme for Prosperity and Fairness.

Customer Service

During 2002, four of the Institute's measurement laboratories that are accredited by the National Accreditation Board (NAB) updated their quality systems to become compliant with the new international standard - ISO 17025. This standard replaces the existing standard (EN 4500) and places greater emphasis on customer service. In addition, work on a Quality Management System within the Institute's Regulatory Service was commenced.



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. In accordance with the provisions of the Safety, Health and Welfare Act, 1989, a safety committee is in place and a Safety Officer is elected by staff members. A safety statement has been prepared and is kept under continuing review.

Finance

The Institute's income in 2002 was €3.594 million made up of grant-in-aid of €2.715 million and €0.893 million in earnings from dosimetry, product certification and other services, license charges, research and consultancy contracts. Capital expenditure, principally on information technology and on personal dosimeters for the Dosimetry Service, was €343,775. Expenditure for the year exceeded income by €157,529.

The Institute complies with all appropriate procurement procedures.

Energy and Efficiency

During 2002, the recommendations of the staff Working Group on Energy and Efficiency were implemented. This Working Group was set up following a Government decision in July 2001 that all State bodies should report annually on measures to reduce energy use in buildings occupied by them. The measures focused on economies in electricity use by powering off computer systems when not in use, switching off lighting in unoccupied rooms and use of energy-saving light fittings. In addition, methods of reducing the costs relating to water heating were put in place.

Information Technology

It is the policy of the Institute to routinely upgrade older equipment and software so as to maintain all systems up to date with current industry standards. The 2002 upgrade programme included the commencement of the migration of desktops and servers to the Windows 2000 operating system, the upgrade of email clients to Outlook Express and the testing of all proprietary database applications to ensure compliance with Windows 2000. Following the preparatory work which was completed in 2001 for the introduction of the Euro, the switch over in January was completed without any difficulties.

During 2002, the Institute upgraded its internal telephone system and replaced its analogue telephone connections with Primary Rate ISDN. These developments have resulted in an increased capacity for handling telephone calls and have reduced the burden on the main switchboard through the use of direct dial access and voice mail.

Also during 2002, IT training for all staff was centralised through the IT department. This resulted in better tailoring of courses to the Institute's needs and in a more cost effective IT training programme.

Environmental Monitoring and Research

The main aim of the work of the Environmental Laboratory is to assess the exposure of the Irish public to radioactive contamination in both the terrestrial and marine environments. This is achieved through the collection and analysis of a range of foodstuffs and environmental samples. The results of these analyses are published in the Marine Monitoring and Environmental Surveillance reports and are available on the Institute's website www.rpii.ie.

The Institute's Environmental Laboratory is the nominated national centre for the measurement of radioactivity in foodstuffs and it maintains a strong commitment to providing a high quality service to its clients. A significant development during the past year has seen the Laboratory's quality system comply with the new international standard, ISO 17025. The numbers and types of samples tested during 2002 are given in Table 1.

Table 1: Radioactivity Testing on Environmental Samples and Foodstuffs, 2002

Sample Type	Number
Air	470
Beef	83
Lamb	83
Pork/Poultry	22
Drinking Water	344
Fish and Shellfish	220
Seawater, Seaweed & Sediment	215
Milk and Dairy products	398
Miscellaneous	354
TOTAL	2189

Sources of Environmental Radioactivity

Naturally occurring radionuclides have been present in all compartments of the environment since the formation of the earth. These include beryllium-7, potassium-40, polonium-210, radon-222 and uranium-238. The Irish environment has also been influenced by a number of artificial sources of radioactive contamination in recent decades. These include liquid and aerial discharges from nuclear installations, fall-out from the Chernobyl accident in 1986, atmospheric nuclear weapons testing during the 1950s and 1960s and discharges to sewage from some hospitals, of radionuclides used for medical purposes. Fall-out of long-lived radionuclides such as strontium-90, caesium-137 and plutonium from nuclear weapons testing as well as caesium-137 fall-out from the Chernobyl accident still persist in the Irish environment. In terms of the Irish marine environment, the discharge of low-level radioactive waste from the British Nuclear Fuels plc (BNFL) nuclear fuel reprocessing plant, situated at Sellafield in Cumbria in the northwest of England, constitutes the most significant source of artificial radioactivity. Discharges from nuclear installations abroad are authorised by national authorities and the radionuclides released are, with the exception of the radioactive gas krypton-85, generally not detected in the Irish terrestrial environment.

Marine Environment

The marine monitoring programme, which is carried out by Institute staff with the assistance of Fishery Quality Officers of the Department of Communications, Marine and Natural Resources, was subjected to a complete review in 2002. This resulted in an extension of the monitoring programme to include a greater range of fish, shellfish and seaweed species.

Samples of fish and shellfish were collected from major



The Environmental Laboratory – Analysis of grain samples by Gamma Spectrometry

landing ports. Seawater, seaweed and sediment samples were also collected from coastal locations, and from the western Irish Sea using the Marine Institute's research vessel, Celtic Voyager.

The consumption of seafood remains the most important exposure pathway by which the Irish public is affected by discharges from Sellafield. The dose to consumers who eat substantial quantities of seafood each day (20 g shellfish, 200 g of fish) was estimated to be less than 2 microsieverts (μSv) in 2002, similar to that in both 2000 and 2001. A small additional dose is incurred through recreational activities such as swimming, walking on

beaches or fishing. Of the Sellafield-sourced radionuclides, caesium-137 continues to be the dominant radionuclide, accounting for approximately 60-70 % of the total dose due to artificial radionuclides in the marine environment. The estimated committed effective dose to heavy consumers due to radiocaesium is shown in Figure 1 for the period 1982 to 2002. As Figure 1 shows, since the Institute's monitoring programme began in 1982 a downward trend has been observed, but in recent years the rate of decline has reduced and the estimated annual dose has levelled off.

While for most radionuclides annual marine discharges from Sellafield peaked in the mid-1970s, technetium-99 discharges to the Irish Sea have increased significantly since 1994, peaking at 192 tera-becquerels (TBq) in 1995. Under the discharge authorisation issued by the UK Environment Agency, current annual discharges are limited to 90 TBq. Increased technetium-99 activity concentrations were measured at all east coast sampling stations between 1994 and 2002, particularly in shellfish samples, in which the activity concentrations of technetium-99 are significantly higher than for caesium-137. Despite this, technetium-99 accounts for less than 30% of the dose to a seafood consumer (see Figure 2) as, compared to caesium-137, technetium-99 delivers a much lower radiation dose per unit activity. These doses may be put into context by comparing them to the average annual dose of $3620 \mu\text{Sv}$ to a member of the Irish public from all sources of radiation.

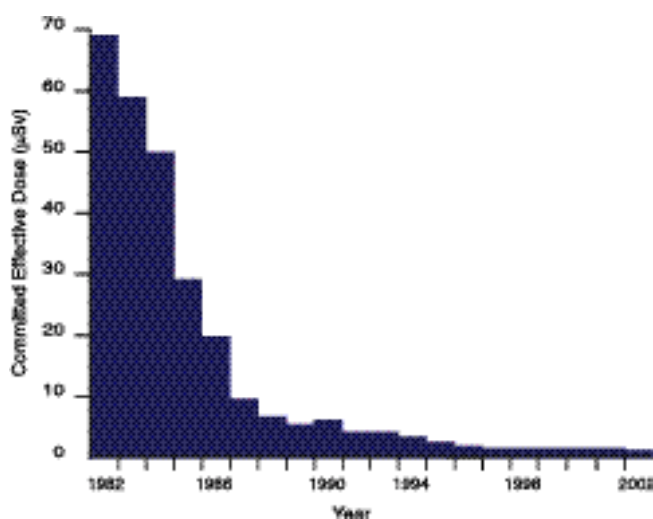


Figure 1: Doses to heavy seafood consumers due to radiocaesium, 1982 - 2002

The doses incurred by people living in Ireland today as a result of the routine operations at Sellafield are now very small and do not constitute a significant health risk. The Institute therefore advises that from a radiological perspective it is safe to eat seafood landed at Irish fishing ports and that no modification of marine-based work or leisure activities is warranted.

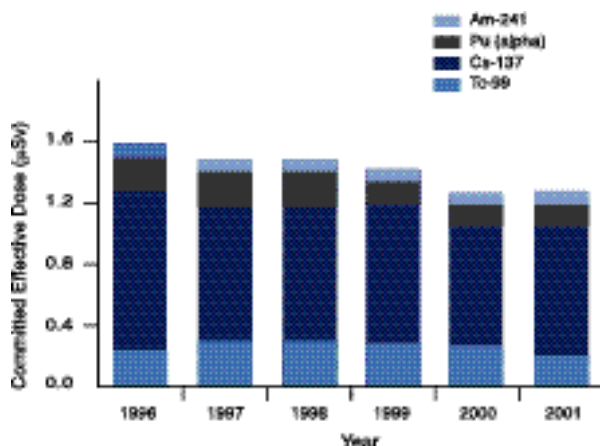


Figure 2: Doses to heavy seafood consumers due to Radiocaesium, Technetium-99, Plutonium (α) & Americium-241, 1996-2001

Terrestrial Environment

The Institute's terrestrial monitoring programme measures the levels of both naturally and artificially occurring radionuclides in air, drinking water and foodstuffs. Upland sheep are also monitored in those areas most affected by the Chernobyl accident. These programmes are carried out with the assistance of the Department of Agriculture and Food, Met Éireann, the Food Safety Authority of Ireland, Local Authorities, Health Boards and commercial producers.

During 2002 the Institute monitored airborne radioactivity at 10 stations across the country. Nine of these were routinely assessed for total beta activity, whilst one station was monitored for gamma emitting radionuclides such as caesium-137 and beryllium-7. In addition krypton-85 was measured on a fortnightly basis at Clonskeagh, Dublin.

Krypton-85 is an inert radioactive gas produced during the operation of nuclear reactors and it is released into the atmosphere during nuclear fuel reprocessing. There are two major nuclear fuel reprocessing plants in western Europe, at Sellafield on the northwest coast of England and at La Hague on the northwest coast of France. Because of its low capacity to react with other materials, krypton-85 distributes uniformly throughout the earth's atmosphere within a few years of release.



The Radiochemistry Laboratory

In 2002, the mean krypton-85 activity concentration was 1.2 Bq/m^3 , similar to that for 2001 (1.3 Bq/m^3). Since the prevailing wind direction is from a west-southwest direction it is unlikely that krypton-85 would arrive in Ireland directly from either Sellafield or La Hague and is therefore likely to have been significantly diluted prior to reaching Ireland.

Following a European Commission Recommendation in 2000, a new programme of diet and ingredients monitoring was commenced in 2002 to assess the levels of radionuclides in the food chain. The programme included measurement of gamma emitting radionuclides in fruit, vegetables, meat and nuts from Dublin, Dundalk and Galway and whole meals from Cork and Galway. Samples taken were representative of foodstuffs purchased at supermarkets and of meals served at centres catering for large numbers of the public. This work is being undertaken in collaboration with the Food Safety Authority of Ireland.

Milk was sampled monthly at 10 milk-processing plants and analysed for strontium-90 and caesium-137. Fifty-nine samples of barley, oats and wheat were sampled during 2002 from the main grain growing areas of the country and analysed for gamma emitting radionuclides.

Drinking water samples were taken from supplies in eight counties as part of a routine cycle in which supplies from each county are tested at least once every four years. These samples were measured for their total alpha activity, total beta activity and tritium concentrations.

Monitoring of upland sheep during the months of summer grazing and at slaughter continued during 2002. A total of 1506 sheep were monitored on upland farms. Of these, approximately 91 % were found to contain radiocaesium concentrations of less than 200 Bq/kg with none exceeding 600 Bq/kg . A total of 1777 sheep were monitored at slaughterhouses serving the home market of which 98 % were found to contain radiocaesium concentrations below 200 Bq/kg with none exceeding 500 Bq/kg .

During 2002 the UK Food Standards Agency was informed of unexpectedly high levels of caesium-137 in a consignment of cranberry juice exported from Germany and possibly destined for Ireland. It was believed that the cranberry juice originated in Eastern Europe and the caesium-137 was due to Chernobyl fall-out. The consignment was eventually returned to the original supplier. As a result of the UK findings, the Institute surveyed the radioactive content of cranberry products used in the Irish food industry. Cranberry products on sale in Ireland were also sampled and measured for caesium-137. While some products contained measurable levels of caesium-137, all were well within the limit of 600 Bq/kg for radiocaesium laid down in EC Regulation 90/737/EEC which specifies limits for foodstuffs imported into the European Union following the Chernobyl accident.

The measurements carried out during 2002 show that the levels of radioactivity in air, water and foodstuffs remain low and are well within accepted international standards.

Radioactivity in Exported Produce

The Institute continued to offer its testing and certification services to Irish exporters of foodstuffs and other goods. The Institute issued 4587 certificates which was a small increase on the 4273 issued in 2001. A comprehensive review of the testing and certification service was carried out during 2002 with a view to streamlining procedures and providing the best possible service to Irish exporters.

Marine Radioecology Research

The fate of the radionuclides discharged from the Sellafield reprocessing plant to the Irish marine environment depends on a number of factors, including the solubility of the radionuclide. More soluble radionuclides such as technetium-99 are transported west across the Irish Sea and northwards out of the Irish Sea, following the overall water circulation pattern. Less soluble radionuclides such as plutonium tend to react with particles in the water column and are soon deposited as sediments on the seafloor. Once deposited on the seafloor these radionuclides may be subject to remobilisation that results in their re-introduction to the overlying seawater. The processes involved in such remobilisation are the focus of an international research project entitled REMOTRANS in which the Institute is participating.



Sampling seawater on the Irish coast

During 2002, the Institute compiled a database of radiological measurements in sediments from five contaminated European marine zones, including the Irish Sea. The database is being used by the 12 participant laboratories of the REMOTRANS project to assist improved assessments of the inventories of artificial radionuclides in these zones. Plutonium analyses

continued on the 21 sediment cores collected by the Institute during 1999. In addition, a further three sediment cores each of over a metre length were collected during the Institute's annual Irish Sea sampling campaign on the research vessel, Celtic Voyager. Preliminary data on the distribution of plutonium in the surface sediments of the western Irish Sea are mapped in Figure 3.

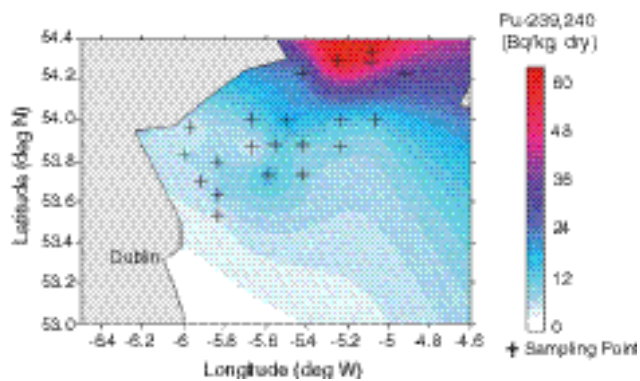


Figure 3: Pu-239,240 activity concentration in surface sediments of the western Irish Sea

Analysis of seaweed samples around Ireland have shown that while the plutonium levels in seaweed have decreased since the 1980s, on the west coast the percentage contribution of Sellafield-sourced plutonium has increased. The transport of plutonium from the Irish Sea to the west coast is being studied by measuring and comparing the plutonium ratios in seaweed samples collected in Galway Bay since 1982.

Natural Radioactivity

One of the key objectives of the Institute is the monitoring of natural sources of radiation in homes and workplaces, including schools, and the assessment of radiation doses arising from exposure to such sources. In most cases the principal source of radiation exposure is radon gas. However, for some specific work situations, such as found in the gas industry and in electricity production by the burning of peat or coal, exposure from natural sources of radiation other than radon may be of concern. Records of radiation doses received by aircrew due to exposure to cosmic radiation are also monitored. The Institute provides a radon measurement service accredited to ISO 17025.

Radon in Homes

During 2002 the Institute's radon measurement service completed 1034 measurements in domestic dwellings. Since the commencement of its radon programme the Institute has identified 2612 dwellings with annual average radon concentrations above the Reference Level of 200 Bq/m³. This corresponds to 2.9% of the approximately 91,000 dwellings predicted to be above the Reference Level on the basis of the National Radon Survey. Exposure to domestic indoor radon is by far the largest contributor of radiation dose to the Irish population and prolonged exposure to high radon concentrations is known to cause lung cancer. The Institute recommends that all householders, especially householders in High Radon Areas identified by the National Radon Survey, have their dwellings surveyed for radon and have remedial work carried out when high radon levels are found.

The 1997 Building Regulations require that radon preventative measures be incorporated into all new dwellings at the time of construction. Following a pilot survey in 1999 of radon levels in houses built in Ennis since the introduction of the new Building Regulations, the Institute commenced a second survey to establish with greater certainty if radon levels are generally lower in houses built since 1998. With the assistance of Kerry County Council radon detectors were issued to 117 new homes in Tralee towards the end of 2002.

In March 2002 the Radiological Protection (Amendment) Act, 2002 passed into law. This Act provides the legislative basis for a scheme of grants to assist householders with the cost of remedying high radon levels in their homes, and identifies the Institute as the body responsible for administering the grant scheme. Due to financial constraints, the Government has not implemented the grant scheme. However, due to budgetary constraints, Exchequer funding is not available to support this scheme.

Radon in Schools

During the period 1999-2001 a nationwide programme was undertaken jointly with the Department of Education and Science to measure the radon concentrations in every classroom in all primary and second-level schools. The survey identified 898 schools in which one or more rooms had radon concentrations in excess of 200 Bq/m³, the concentration above which the Institute recommends remedial action.

The Department of Education and Science is currently implementing a programme of remedial action to reduce radon levels in schools identified as having high radon



Preparing radon detectors

levels. For concentrations up to 400 Bq/m³, remedial action normally involves increasing the ventilation in the room in question. For higher concentrations an active system such as the installation of a sump is usually necessary. Following completion of remedial work schools are retested by the Institute to verify that the work has been effective.

By the end of 2002 the Institute had completed 1637 such measurements in 97 schools and the results indicate that the remedial work has been successful in reducing radon concentrations in affected schools. The installation of sumps resulted in an average reduction in radon concentrations of 81% while the corresponding figure for increased ventilation was 47%.

Radon in Workplaces

The Radiological Protection Act, 1991 (Ionising Radiation) Order, 2000 (S.I. No. 125 of 2000) specifies a Reference Level for radon in workplaces of 400 Bq/m³, averaged over any three month period, above which employers are required to evaluate whether remedial measures to reduce the radon concentration should be undertaken. In addition, S.I. No. 125 of 2000 empowers the Institute to direct employers to carry out radon measurements.

Above Ground Workplaces

During 2001 approximately 3100 employers in Ennis and Tralee were directed by the Institute to carry out radon monitoring and to submit the results of the monitoring to the Institute. By the end of 2002 the Institute had received the results of radon measurements from 408 employers, comprising 214 in Ennis and 194 in Tralee. A further 290 employers indicated their intention to conduct radon measurements. Close to 1500 employers, or 48% of the original 3100 who received direction letters from the Institute, had not replied to correspondence.

Radon concentrations in excess of 400 Bq/m³ were found in 4.6% of monitored workplaces in Ennis, and 13.9% of monitored workplaces in Tralee. These employers were advised in accordance with the Regulations to carry out assessments to determine if mitigation of the workplaces is justified.

Underground Workplaces

During 2002 the Institute directed the owners of three commercial show caves, the owner of one outdoor adventure centre which included caving/potholing in wild caves, and the operator of one commercial mine to conduct personal radon monitoring of staff in their employment.

Results to the end of 2002 indicated that out of a total of 33 staff monitored, 25 were identified as receiving annual radiation doses in excess of 1 millisievert (mSv), while one worker received a dose in excess of 6 mSv. No worker received a dose in excess of 20 mSv, the annual dose limit for workers specified in national legislation.

The Institute met with the cave owners in question to impress upon them the importance of keeping doses below 6 mSv and to urge them to investigate ways of reducing radon exposure to staff. The Institute continues to review radon exposures in caves to ensure doses are kept as low as reasonably achievable.

Radon in Drinking Water

During 2002, a pilot study of radon in drinking water in Co. Wicklow was completed with the assistance of Wicklow County Council. County Wicklow was chosen primarily on the basis that parts of the county are known to have high instances of radon in air in homes and many residents use private supplies for their drinking water.

Radon activity concentrations were measured in the private drinking water supplies of 166 houses in the county. Four houses had activity concentrations in excess of the recommended European Commission action level of 1000 Bq/l, 15 had activity concentrations between 500 and 1000 Bq/l, 51 had activity concentrations between 100 and 500 Bq/l and 96 had activity concentrations below 100 Bq/l. These results are illustrated in Figure 4.

The doses estimated for the ingestion of radon bearing water vary significantly with the quantity of drinking water consumed and the degree to which the water has been processed prior to consumption. However, at normal drinking rates, dose estimates based on measurements made in this study demonstrate that radon in drinking water may pose a significant additional health risk, in the longer term, to some consumers. On foot of this study, an advice document was issued to Local Authorities advising that they identify and survey those water supplies likely to have elevated concentrations of both radon and other naturally occurring radionuclides.

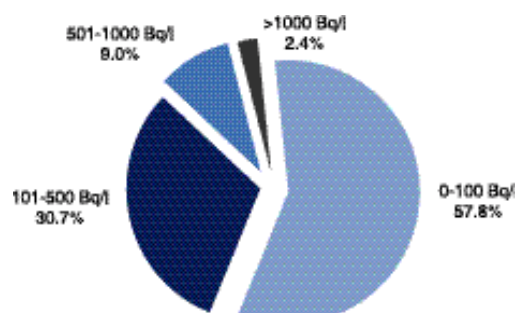


Figure 4: Radon in Private Drinking Water Supplies, Co Wicklow

Materials containing Enhanced Levels of Natural Radioactivity

International surveys indicate that certain materials not generally regarded as radioactive may give rise to significant radiation doses to workers and/or members of the public. These Naturally Occurring Radioactive Materials (NORM) include materials such as scale that may build up in pipes and valves of gas, coal or mineral processing plants, and ash from the burning of coal and peat for electricity production. The chemical or physical processing of such material may increase the risk of exposure through specific exposure pathways, such as inhalation and ingestion.

During 2002, the Institute initiated a programme to identify the types of industries operating in Ireland which, on the basis of recommendations and guidance from the European Commission, are considered likely to involve work practices resulting in exposure to NORM. The main focus of this effort was to heighten awareness among the industries of the potential hazards involved.

A project was initiated in collaboration with Trinity College Dublin and the ESB to assess exposures from NORM in peat-fired power stations. The levels of uranium-238 and radium-226 in peat in Ireland can be as high as 788 and 479 Bq/kg, respectively. Assuming that the peat used in power production has comparable amounts of these radionuclides, significant amounts of natural radionuclides may be processed annually during electricity production. Final results of the study will be published during 2004.



Institute Inspector checking for radioactivity in scrap metal

Staff also maintained close liaison with offshore gas operators in Ireland on the monitoring of their work activities. As a means of determining whether a radon hazard exists for the gas user, the Institute recommended surveillance of radon gas levels in the gas stream. An assessment of international experience of the handling and disposal of NORM materials from the oil and gas industries was also conducted.

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 legislation applies to those air operators whose crew are likely to receive an annual dose greater than 1 mSv. The holder of an air operator's certificate (AOC) is required to evaluate the doses received by their aircrew to determine if measures to control and monitor exposure to cosmic radiation are warranted. The doses received per flight are evaluated using software produced by the Civil Aeromedical Institute in the United States. This information is combined with details of flights and flying hours to provide an estimate of the radiation dose received by each individual. These dose evaluations must be submitted to the Institute within 3 months of the end of each calendar year.

Information relating to 2002 received from three airlines showed that 2662 individuals were estimated to receive annual doses above 1 mSv. Of these, 1528 received less than 2 mSv while 1129 received 2 to 4 mSv. Five crew received over 4 mSv, with the highest estimated annual dose being 4.25 mSv.

European Radon Research and Industrial Collaboration Concerted Action (ERRICCA)

ERRICCA provides a mechanism for the co-ordination and dissemination of scientific knowledge of radon related issues at a European level, and operates under the aegis of the European Commission's 5th Framework Programme. ERRICCA is a three-year project which commenced in February 2002 and is co-ordinated by the Building Research Establishment (BRE) in the United Kingdom. The Institute together with the National Technical University of Athens and Risø National Laboratory, Denmark, support BRE as project contractors.

In September 2002 the Institute hosted the first Irish National Radon Forum, established as part of the ERRICCA project. Government Departments and Agencies, professionals such as architects, engineers and research scientists, and representatives of the radon industry, attended the meeting. The meeting provided the opportunity for discussion on topics such as radon measurement programmes, remediation protocols for buildings and the type of research needed to underpin national policies.

Emergency Planning

The National Emergency Plan for Nuclear Accidents (NEPNA) has been developed to provide a rapid and organised response to nuclear accidents abroad, which have the potential to contaminate the Irish environment or to result in exposure to the Irish population. The Institute has been assigned a number of key roles under this Plan, which include activation of emergency arrangements in the event of an accident, monitoring the environment and the food chain, assessing the consequences of any accident and advising the Government on protective measures.

A key priority for the Institute during 2002 was to address issues arising from the review of the Plan carried out during 2001 by external consultants Environmental Resources Management. This review included an external audit of the plan, a tabletop exercise and a major exercise involving a full call-out of the Emergency Response Co-ordination Committee (ERCC).

During 2002 the Emergency Planning Group undertook a wide-ranging review of the network of fixed radiation monitoring stations, which considered potential operational weaknesses under emergency conditions, the opportunity for improved effectiveness in the light of advances in technology since the system was originally commissioned

and the adequacy of the geographic coverage provided by the network. The conclusions of this review indicated the need to upgrade some of the monitoring equipment and to increase the station density along the eastern and southern coastlines, including the use of on-line air sampling stations with the facility to identify and quantify the radionuclides present in the air. This report has been forwarded to the Government for consideration.

The rapid and efficient flow of information is an important element of emergency management. The Emergency Planning Group reviewed the likely flow of information during an emergency both between the Institute and other organisations, and within the Institute. This review will be used as the basis for the development of an information management system.

During the year the Institute participated in an inter-departmental group charged with identifying a suitable location for a national emergency control centre and specifying the facilities required for effective operation of such a centre. It is intended that this centre will become the operational centre for the ERCC.



Modelling accident scenarios using ARGOS

Under the NEPNA the Institute is charged with responsibility for making a technical assessment of the consequences of any nuclear accident with the potential to impact on Ireland. The emergency decision support tool ARGOS (Accident Reporting and Guiding Operational System) is of central importance to the Institute in fulfilling this role. Weather data essential for the operation of the system is supplied on-line by Met Éireann. The ARGOS system is updated regularly so that any lessons learnt from exercises or experience can quickly be incorporated into operational systems. This on-going development is managed by the ARGOS consortium, of which the Institute is a member. In 2002 Canada joined Denmark, Ireland, and Norway in this consortium strengthening its international dimension.

In May the Institute participated in an exercise organised by the co-ordinators of DSSNET (Decision Support Systems NETwork). DSSNET is a network of users and developers of the RODOS (Realtime Online Decision Support) and ARGOS emergency decision support systems, which is funded under the European Commission's 5th framework research programme. The exercise simulated a potentially large release of radioactivity from a nuclear reactor affecting a number of countries downwind. Each country carried out assessments of the accident and these assessments were

compared at a conference in July. The lessons learned will be implemented in systems and procedures to aid decisions in case of a real emergency. The exercise also proved a useful training opportunity for members of the Institute's technical assessment team.

The Institute continues to play a crucial national role in maintaining emergency alerting arrangements in a state of readiness. These arrangements include the ECURIE and EMERCON international early warning systems, the national network of early warning and monitoring stations and the Institute's on-call duty officer system. Routine testing of early warning systems is of particular importance and during the year eight tests were carried out, all of which showed the systems to be operating satisfactorily. Additionally, ECURIE communications channels are tested daily and Institute staff are alerted automatically of any failures.

The Institute participated in the development of a revised public information booklet on the NEPNA, which was published by the Department of Public Enterprise in March 2002. This booklet describes the national emergency arrangements and sets out guidance for the public on what to do in a nuclear emergency. At the same time as the booklet was published, a summary leaflet was distributed to every home in the country.

Regulatory Service

Under S.I. No. 125 of 2000 all practices involving the use of sources of ionising radiation require a license from the Institute. These include sources used in medicine, research and industry. Attached to each license is a set of conditions that requires the licensee to put in place the arrangements necessary to ensure that all exposures are kept as low as reasonably achievable and that dose limits are not exceeded. The license conditions are reviewed at regular intervals to ensure that they reflect good practice. In addition, the Institute issues Codes of Practice on various aspects of radiological protection.

The Regulatory Service carries out regular inspections to ensure that licensees comply with regulations, license conditions and International Atomic Energy Agency (IAEA) recommendations on radiological protection.

Licensing and Inspection

In recent years there has been an increase in the number of applications and users of sources of ionising radiation. This is reflected in an increase of over 60% in the annual number of licenses in place between 1993 and 2002 (Figure 5). Table 2 illustrates the breakdown, by category, of the inspections carried out during 2002. In addition to the licenses listed in the table there were 755 dental licenses in force. A small number of dental practices are inspected each year and during 2002, five inspections of dental practices were undertaken.

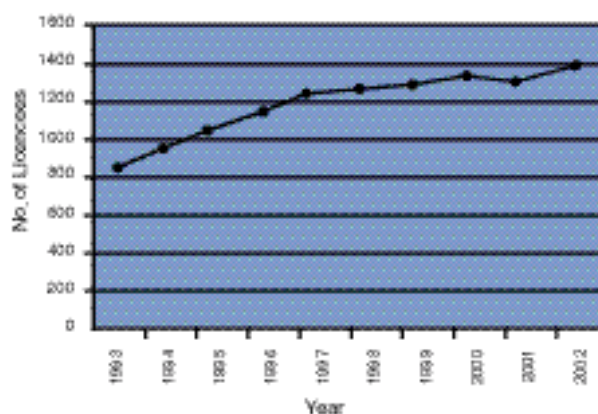


Figure 5: Annual number of licensees.

License Category	Number in Category	Inspections Undertaken in 2002
Process Irradiators & Cyclotron	4	1
Industrial Radiography	24	16
Lightning Preventors	9	4
Manufacturers of Devices	4	2
Industrial Users	235	19
Education & Research	18	4
Government Depts & State Run Services	7	4
Hospitals/Medical	122	18
Custody Only	22	7
Distributors	55	3
Veterinary Surgeons	127	2
Chiropractors	8	0
Contaminated Scrap Metal	2	2
TOTAL	637	82

Table 2: License Categories and Inspections, 2002



Checking that a source is properly shielded

The Regulatory Service's inspection programme is designed to focus on those aspects of the licensees' activities which have the potential to impact most significantly on radiation protection and safety. This is in line with the recommendation of the IAEA peer review of the Institute's Regulatory Service carried out in 2000, which advised that greater emphasis be placed on assessing the safety aspects of licensees' activities during inspections. In the case of industrial radiography practice, some inspections are now carried out on-site while radiography is actually being performed. These inspections complement the examination, by the inspector, of source storage arrangements, documented procedures and record keeping.

Incidents

In January the Institute was notified of an incident at a Dublin hospital involving radiotherapy equipment in which radiation sources are positioned within the patient for the treatment of tumours. In the equipment involved, radiation sources travel through guide tubes to where the tumour is located and are retracted when the treatment is either terminated or interrupted. In this incident a source did not retract fully into its safe position. A warning light quickly drew the attention of the nurse, and the patient was removed from the source of the radiation. The hospital physicist, in consultation with the manufacturers, then proceeded to clear the fault. Although an inadvertent additional dose of radiation was delivered to the patient, it was not considered to be significant due to the short exposure time involved. A subsequent investigation traced the fault to the ingress of moisture into the guide tubes, which have since been replaced. The hospital's procedures have been modified to require the monitoring of the condition of the guide tubes on a more regular

basis. It is reassuring to note that the hospital's emergency procedures were found to adequately cope with the incident so that there was no significant radiation exposure to staff attending the incident, and any additional radiation dose to the patient, above the prescribed value, would have been insignificant.

In October the Institute was informed by the Radiological Protection Officer of an Irish airline that a 4.57 MBq caesium-137 source had been inadvertently shipped from Dublin to Stockholm, via Helsinki. The source was originally intended to be shipped on a flight from Dublin to Frankfurt. The radioactive source was correctly shielded and packaged in accordance with transport regulations, i.e. shielded in a lead container enclosed in cardboard packaging. However, the declaration form did not indicate that the source was appropriately shielded, and the package was rejected in Dublin by the airline as being unsafe to transport. This resulted in the package being isolated at Dublin airport. Subsequently the source was inadvertently placed on a flight to Helsinki and from there onto Stockholm. The circumstances surrounding the onward shipment from Helsinki to Stockholm are unknown. The Institute instructed the airline concerned to review its procedures for the handling, storage and transportation of radioactive materials and to ensure that all staff are made aware of these procedures. The incident was reported to the Illicit Trafficking Database Office of the IAEA as it is classified as an unauthorised transfer between Member States of the IAEA under the terms of reference of the illicit trafficking programme.

In November, the Dublin Port Authorities informed the Regulatory Service that they had been advised by their counterparts in Teeside, that a radiation alarm on the Hartlepool Nuclear Power Plant perimeter fence in the UK had activated while the gas tanker Lydia Kosan, which was bound for Dublin, was leaving Teeside. The UK Regulator, the Nuclear Installations Inspectorate (NII) also brought the matter to the Institute's attention. An inspector from the Regulatory Service carried out a detailed radiation survey of the Lydia Kosan, while at anchor in Dublin Bay, prior to it being allowed to dock in Dublin Port. No external radiation levels above background were detected.

Prosecutions

While the majority of licensees comply with the regulations and with the requests of inspectors in pursuance of the regulations, some fail to do so and as a result legal proceedings are initiated. During the year the Regulatory Service successfully prosecuted four licensees.

An airport authority was convicted and fined for the unlicensed custody of two x-ray units and for the unlicensed custody and use of four other x-ray units, while another airport authority was convicted and fined for the unlicensed custody of an x-ray unit. In another case, a pharmaceutical company was prosecuted for the unlicensed custody of uranium-238 in the form of Uranyl Acetate. A prosecution was also taken against a local

authority for unlicensed custody of two nuclear moisture density gauges. In addition to the unlicensed custody offence, the local authority was also successfully prosecuted for failure to calibrate a measuring instrument and failure to keep records of calibration.

New Legislation

In October, the European Communities (Medical Ionising Radiation Protection) Regulations, 2002 (S.I. No. 478 of 2002) were enacted giving effect to Council Directive 97/43/Euratom on the health protection of individuals against the dangers of ionising radiation in relation to medical exposures. The new statutory instrument replaces the European Communities (Medical Ionising Radiation) Regulations, 1988 (S.I. No. 189 of 1988) and the European Community (Radiological and Nuclear Medicine Installations) Regulations, 1998 (S.I. No. 250 of 1998).

Responsibility for the new regulations rests with the Minister for Health and Children, whereas responsibility for the licensing of radiation sources, including those used for medical purposes, lies with the Institute. The new legislation is welcomed as it further enhances the radiation protection requirements in the medical sector and the Institute is co-operating with the Department of Health and Children to ensure that, as far as possible, a coherent approach is adopted to the enforcement of all regulations relating to radiation protection in the medical sector.



On-site inspection by an officer of the Regulatory Service



Use of radiation in veterinary medicine

IAEA Missions

The Regulatory Service has contributed, over a number of years, to the IAEA's Model Project on upgrading radiation and waste safety infrastructures in Africa, Asia and Eastern Europe. This project was established to assist Member States in these regions in which significant shortcomings in the radiation protection infrastructure had been identified. While on leave of absence from the Institute, a member of the Regulatory Service previously worked on this project as the manager responsible for its development and implementation in Africa.

During the year two Institute staff were recruited by the IAEA to deliver lectures on training courses on Regulatory Authorisation and Inspection of Medical Facilities using Radiation Sources, and on Authorisation and Inspection of Industrial Sources in Industrial Radiography, held in Libya and Turkey, respectively.

Non-nuclear countries that are in the process of establishing a radiation protection infrastructure, find many aspects of Ireland's regulatory system suitable for adoption in their own countries. In December the Regulatory Service hosted an IAEA sponsored scientific visit for a senior staff member from the Department of Labour Inspection in Cyprus. The visit was arranged so that experience gained in transposing European Union

Directives on radiation protection into Irish legislation, could be shared; Cyprus is obliged to transpose these Directives into national legislation before it becomes a member of the EU. In addition, the Regulatory Service hosted IAEA sponsored scientific visitors from Kuwait and Syria.

Quality Management System

During 2002, following a recommendation of the 2000 IAEA peer review mission, work began on putting in place the necessary arrangements to introduce a Quality Management System within the Regulatory Service. Significant progress has been made, and work on drafting the procedures and setting up the necessary protocols has reached an advanced stage.

Code of Practice for Radiation Protection in Veterinary Medicine

In November a revised and updated Code of Practice for Radiation Protection in Veterinary Medicine was published. This Code of Practice updates the original document prepared in June 1989 by the then Nuclear Energy Board and in particular reflects the changes in regulations as specified in S.I. No 125 of 2000. The Code of Practice was sent to all holders of veterinary licenses.

Dosimetry Service



The Dosimetry Service processes about 80,000 dosimeters per year

The Dosimetry Service offers a personal monitoring service for determination of occupational exposure to ionising radiation. The service uses thermoluminescent dosimeters (TLDs) and PADC neutron dosimeters capable of determining whole-body doses from x-ray, gamma and beta radiation and neutrons. Extremity TLDs are used to measure the dose to hands, eye, neck and feet from x-ray, gamma and beta rays.

During 2002, approximately 80,000 dosimeters were supplied to customers in the health services, industry and universities. In total some 7700 individuals were monitored at almost 1400 different sites around Ireland.

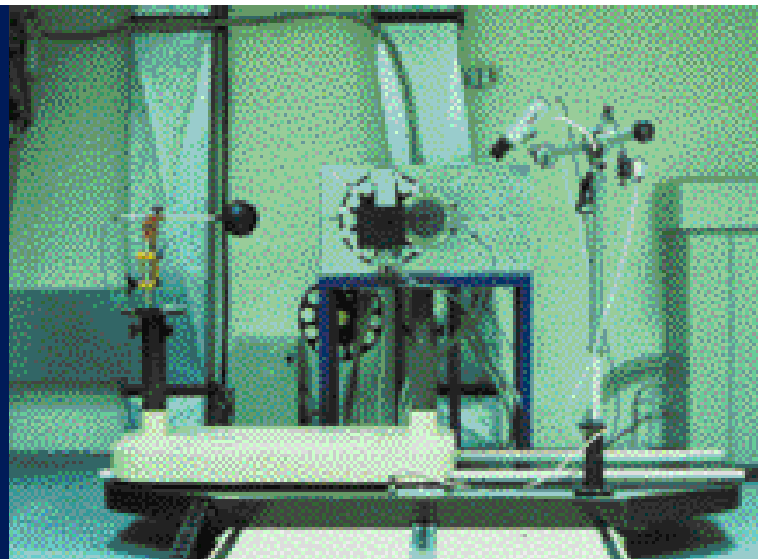
The highest annual whole-body dose recorded during the year was 9.4 mSv. This dose was received by an industrial radiography technician and was a result of a high workload. This may be compared with the annual whole-body dose limit of 20 mSv for radiation workers. Measurable extremity doses were recorded by personnel working in industry, research and in the cardiology, radiotherapy and nuclear medicine departments of

hospitals. The highest annual extremity dose of 137.6 mSv was received to the hand of a hospital radio-pharmacist. This value may be compared with the annual dose limit of 500 mSv for the hands, forearms, feet and ankles of radiation workers.

In keeping with the Service's commitment to maintaining a high quality of service, the laboratory updated its quality system to meet the requirements of the new standard, ISO 17025. A paper on the Service's transition to the new standard was presented at the International Radiation Protection Association's (IRPA) Regional Congress in Florence in October 2002. During the year the Service acquired a new large capacity TLD reader and an additional 10,000 whole-body TLDs. The new reader was brought into service in June, following rigorous dosimetric and operational testing.

The Service had identified as a key objective for 2002 that technical staff from the Instrument Calibration and Dosimetry Services should be fully trained to do each other's jobs. This training was completed during the year.

Instrument Calibration Service



The Institute's calibration facility

The Instrument Calibration Service offers calibration of dose and dose-rate meters, surface contamination monitors, and personal monitors/ alarms which are used to give a direct reading of radiation dose to an individual. In addition the service offers wipe testing of sealed radioactive sources for leakage of radioactivity.

Instruments are checked in accordance with customer requirements for compliance with the relevant manufacturer's specification by exposing them to radiation of different energies and dose-rates. A calibration certificate containing the results and test data is issued to the client. In 2002 a total of 338 instruments were tested, of which 20 failed to meet the manufacturer's specification.

Accurate measurement using calibrated instruments traceable to International Standards is essential to ensuring the safe and effective use of ionising radiation. Calibrations carried out by the Instrument Calibration Service are traceable to the National Physical Laboratory (NPL) primary standards laboratory in the UK. The service holds internationally recognised Secondary Standard

status and is a member of the International Atomic Energy Agency (IAEA) Secondary Standard Dosimetry Laboratory Network. The service also holds National Accreditation Board "ILAB" accreditation and during the year, it updated its quality system to meet the requirements of the new standard, ISO 17025.

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 source housing and analysing the radioactivity content of the wipe. In 2002 a total of 413 sources were checked. None of the wipes contained greater than the allowable quantity of radioactivity specified in license conditions.

Nuclear Safety and International Liaison

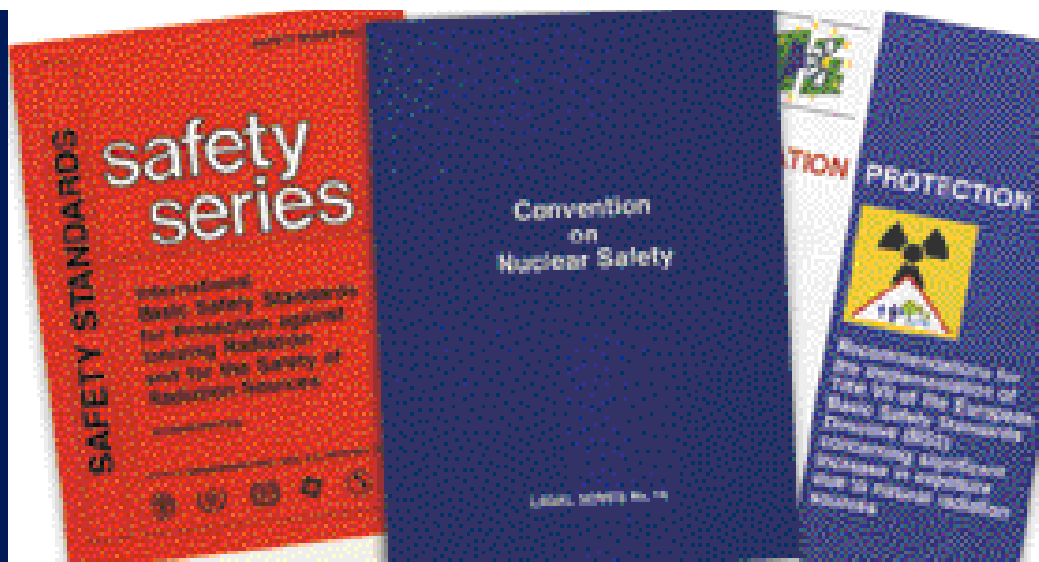
Institute staff continued to be active in the key international organisations that develop standards and guidance on safety in the use of ionising radiation and nuclear power. These organisations include the European Union, the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD) as well as those associated with the international conventions such as the Nuclear Safety Convention, the OSPAR Convention, the London Dumping Convention and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. It is important that the Institute participates in these bodies to ensure an Irish input into their work.

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. It also joined the Department of the Environment and Local Government in formal meetings with the UK Department of the Environment, Transport and the Regions and other UK Government 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.

OSPAR Convention on the Protection of the Marine Environment of the North East Atlantic

The Institute acts as scientific advisor to the Government on the implementation of those aspects of the Convention dealing with radioactive pollution. Particular attention is focused on the OSPAR Strategy with regard to Radioactive Substances, signed by all Contracting Parties in 1998. The Strategy requires progressive and substantial reductions in discharges of radioactive substances, with specific targets for both naturally-occurring and artificial radionuclides which must be met by 2020.

Members of the Institute's staff sit on the Radioactive Substances Committee of OSPAR. During 2002 the work of this Committee focused on the scientific issues surrounding the setting of baseline values against which compliance with the Strategy commitments, entered into by all Contracting Parties, could be evaluated. National Plans, aimed at achieving the objectives of the Strategy, were discussed and evaluated by the Radioactive Substances Committee in October 2002. From Ireland's point-of-view, concerns remain about the degree to which some Contracting Parties intend to reduce their radioactive discharges in future years.



Ireland is continuing to implement its own National Plan for compliance with the Strategy through stricter controls on the use of unsealed radioactive substances and their subsequent disposal to the sewage system. Licensees are now also required to report annually on the quantity and type of radionuclides disposed of during the previous year.

United Nations Convention on the Law of the Sea (UNCLOS)

Since the initiation of legal proceedings by Ireland in October 2001 to prevent the full commissioning of the Sellafield MOX Plant (SMP), the Institute has continued to act as scientific advisor to the various Government Departments and Agencies directly involved in the case. Staff from the Institute provided scientific briefing to Ireland's legal team, including an evaluation of those aspects of the United Kingdom's arguments directly related to radioactivity. In instances where it was felt that an independent scientific viewpoint should be sought, the Institute helped identify internationally recognised scientists competent to fulfil that role. The expertise of the Institute was subsequently used to critically review all such commissioned reports and to identify any issues raised that required further evaluation.

Nuclear and Radiation Safety Abroad

During the year, the Institute was informed, through the IAEA Information Service, of 36 incidents around the world of which 14 were in the UK. In the case of incidents in the UK, reports were also received from the UK authorities, in most cases from the Nuclear Installations Inspectorate. Some of these incidents involved nuclear installations, while others involved loss, misuse or theft of radiation sources. None of the incidents abroad, involving either radiation sources or nuclear installations, had consequences directly affecting Ireland.

The incident that was perhaps of greatest concern was the break-up and complete failure, in May 2002, of one of the gas circulator impellers on one of the two British Energy Advanced Gas Cooled reactors at Torness in the UK, and the detection of increased vibration in the circulator on the other reactor. The circulators pump the reactor cooling gas (carbon dioxide) through the reactor core to transfer the heat generated by the nuclear reaction to the steam generators, which in turn produce the steam that drives the turbines. The level of back-up in the gas circulating systems prevented safety being seriously compromised at any stage. The incident led to both reactors being shut down pending an investigation.

Both faulty circulators were replaced and better vibration monitoring equipment installed along with the introduction of more comprehensive monitoring procedures. This work has now been completed and the reactors have been returned to service. British Energy has not detected any defects on the other gas circulators at Torness or at the Heysham 2 reactor, which uses the same type of gas circulators.

In June 2002 BNFL announced that it was bringing forward the closure date of the Calder Hall Magnox reactors from 2006-2008 to March 2003. The Institute welcomed this development, having expressed concern on a number of occasions about the continued operation of these reactors, given in particular, their age and their apparent vulnerability to terrorist attack.

European Union

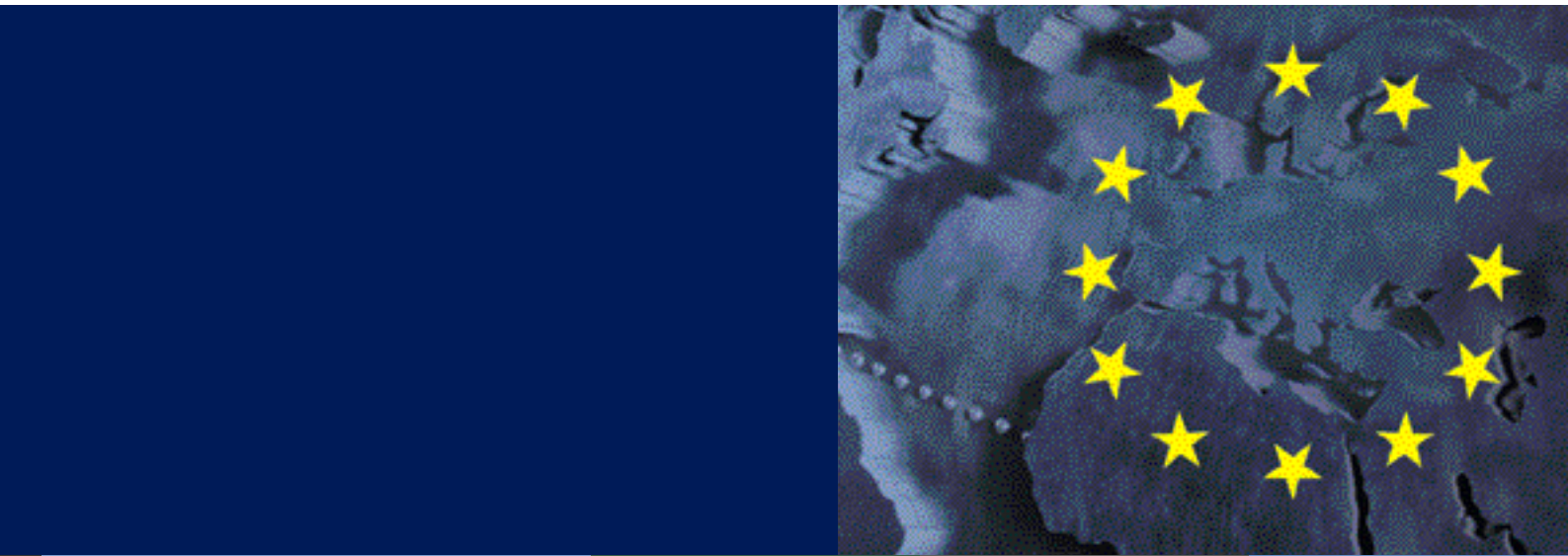
The Institute continued to provide Irish delegates to a number of committees and working groups dealing with a wide range of nuclear safety, radiation protection,

radioactive waste management and environmental issues at European Union level in addition to providing advice for the Irish delegates attending European Council and Council Working Group meetings. Of particular note during 2002, was the progress made in the development of three new directives addressing nuclear safety, safety of radioactive waste management and safety of high activity sealed sources.

The Nuclear Safety Package

The European Commission has proposed two Directives, one setting out basic obligations and general principles on the safety of nuclear installations and the second on the management of spent fuel and radioactive waste.

The first proposed Directive is intended to ensure that there is a high level of nuclear safety in all Member States with nuclear facilities, and especially in those States which are due to join the European Union in 2004; these states have a total of 19 nuclear power reactors between them. The Directive requires, in particular, an independent and



adequately resourced regulatory authority to be established in each Member State to ensure nuclear safety. The Directive will also explicitly oblige Member States to ensure that adequate financial resources are made available to support the safety of nuclear installations and to cover decommissioning costs. While all the Applicant States have gone some way to meeting this and other requirements relating to nuclear safety within the framework of the negotiating process, once they become Members this Directive will be the only legal instrument to ensure that commitments made will be fully honoured.

The second proposed directive will oblige Member States to make suitable arrangements for the long term management of historic wastes as well as the 40,000 cubic meters of radioactive waste that are produced each year, mainly from activities associated with nuclear generation of electricity.

Directive on High Activity Sealed Sources.

Progress towards the finalisation of this Directive continued during 2002. It is expected that the Directive will come into force by the end of 2003, with Member States being given two years to transpose it into national legislation. The Institute believes that the existing regulatory structure in Ireland under which all activities involving radiation sources, other than very small exempted sources, require a license from the Institute, will meet most of the requirements of the proposed Directive. However, the Directive will place an obligation on Member States to provide a facility for the centralised storage of sealed sources, and will require the installation of radiation detection systems at key locations such as airports, ports and scrap metal handling enterprises. Such a storage facility and detection systems are not currently available in Ireland.

Library and Information Service

The Institute provides a library and information service as a source of information on radiological protection and issues relevant to the Institute's activities. The library at the Institute houses a specialised collection of books, technical reports and journals. It is open to outside readers and provides a reference service to researchers, students and members of the public. It also services the needs of the staff of the Institute.

There is a continuing demand for information on the Institute and its activities with almost 1000 enquiries received by the Information Service in 2002. An important and increasingly indispensable channel of communication is the Institute's Website. The Website has attracted an increasing number of users over the year and it is noticeable now that people first visit the Website for information before directly contacting the Institute. The Website was first launched in 1999 and was upgraded in 2002 when the Home Page, in particular, was re-designed with guidance from the Institute's Website Committee. The new look allows easy access to information on the range of Institute activities, publications and news. The number of visitors to our website varied from 1500 to 2622 per month, with maximum interest when a press release was issued by the Institute or during periods when radiation issues were mentioned in the media. The Website address is www.rpii.ie

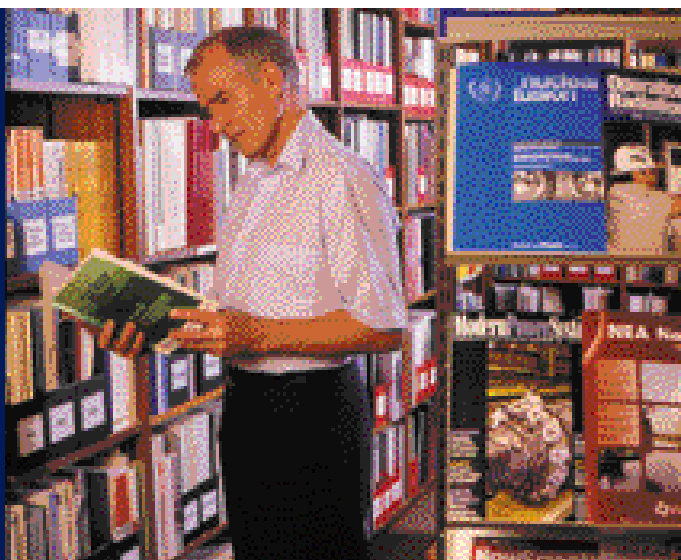
During 2002, press releases were issued on a variety of subjects including Institute publications, radon surveys, and results of radioactivity monitoring programmes. Approximately 150 media requests for information were answered during the year. This included over 50 interviews provided by staff for radio and television programmes.

Staff regularly participated in conferences, seminars and exhibitions both nationally and internationally and, when requested, the Institute 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.

During 2002, the Institute assisted in the organisation of an EU funded international conference, "International Symposium on Medico-Legal Exposures". The conference provided a forum to experts involved in the use of X-rays for medico-legal purposes to exchange their experiences and views about the ethical, legal, social and technical problems encountered with these practices. The conference successfully raised awareness of the various situations in which an exposure to ionising radiation can be made on medico-legal grounds.

The International Nuclear Information System (INIS) is an information system set up by the International Atomic Energy Agency (IAEA) and its Member States with the purpose of identifying and collating publications related to nuclear science and its peaceful applications. The Institute provides the Irish Liaison Officer for INIS. The system's database is highly relevant to the Institute's areas of activity and items published in Ireland that are suitable to the database are input to the system using software supplied by the IAEA.

During the year, the RPII continued with its programme of publishing scientific reports, which are widely distributed among interested groups and can be downloaded from our website.



The Library houses a specialised collection of books, technical reports and journals

Publications

RPII Reports

Radon in Dwellings. The National Radon Survey.

RPII-02/1.

Environmental Radioactivity Surveillance Programme 1998 and 1999. RPII-02/2.

Code of Practice for Radiation Protection in Veterinary Medicine. RPII-02/3.

Scientific Papers

Curran, L., Spain, D., Rafferty, B., 2002.

A quality assurance system for personal monitoring in Ireland: Experience to date and transition from EN 45001 to ISO/IEC 17025. In **Towards harmonisation of radiation protection in Europe**. Proceedings of European IRPA Congress 2000 jointly with the AIRP Annual Congress. Florence, Italy 8-11 October 2002.

Fennell, S.G., Mackin, G.M., McGarry, A.T., Pollard, D., 2002. Radon Exposure in Ireland. In **High Levels of Natural Radiation and radon areas: radiation dose and health effects**. Proceedings of the 5th International Conference held in Munich, Germany on September 4 to 7, 2000. International Congress Series 1225, p. 71-77. Elsevier Science B.V.

Rafferty, B., 2002.

Second review meeting of the contracting parties to the Convention on Nuclear Safety, Vienna, 15-26 April 2002. **Journal of Radiological Protection**, 22, (2), p.219-221.

Ryan, T.P., 2002.

Implementation of the OSPAR strategy with regard to radioactive substances - an Irish perspective.

Nuclear Energy, 41, (5), p. 347-351.

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Transuranic biokinetic parameters for marine invertebrates - a review. **Environmental**

International, 28, p. 83-96.

Ryan, T., McMahon, C.A., Colgan, P.A., 2002.

Monitoring the impact of Sellafield discharges on Ireland. In **Making Sense of Sellafield**, Proceedings of a RIA Conference, held in Dublin, 26 September 2002. Royal Irish Academy, p. 13-15.

Yoshida, S., Muramatsu, Y., Steiner, M., Belli, M., Pasquale, A., Rafferty, B.*, Rühm, W., Rantavaara, A., Linkov, I., Dvornik, A., Zhuchenko, T., 2002.

Stable elements - as a key to predict radionuclide transport in forest ecosystems. **Radioprotection - Colloques**, 37, (C1), p. 391-396.

General Articles

Pearce, J., Johnson, T., Synott, H.*, Cunningham, J.*, 2002.

The effects of 'Prussian Blue' on plant growth and soil microbiological processes in upland pasture. **The Irish Scientist 2002 Yearbook (10)**, p. 170.

Ryan, T., Colgan, T., 2002.

The OSPAR Convention and the discharge of radioactive substances. **The Irish Scientist 2002 Yearbook (10)**, p. 67.

* RPII staff in conjunction with other authors

Advisory Committees

Environmental Radiation

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 Tom O'Flaherty (retired 2002) Geraldine O'Reilly David Pollard Wil van der Putten Barbara Rafferty William Reville Adi Roche Tom Ryan (secondment to EU 2003) Philip Walton
Scientific Secretary	Stephanie Long (appointed 2003)

Medical Radiation

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 (appointed 2003) David Fenton Edward Fitzgerald Christopher Hone Lynn Johnston Pat Kenny Brendan McClean Ann McGarry Lesley Malone James Masterson Kate Matthews Michael Moriarty Dan Murphy Liam Murray (retired 2003) Tom O'Flaherty (retired 2002) Geraldine O'Reilly Wil van der Putten Stephanie Ryan
Scientific Secretary	Stephen Fennell (appointed 2003)

Report of the Comptroller and Auditor General

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

I have audited the financial statements on pages 4 to 10 under Section 16 of the Radiological Protection Act, 1991.

Respective Responsibilities of the Institute and the Comptroller and Auditor General

The accounting responsibilities of the Institute are set out in the Statement of Responsibilities of the Institute on page 3. It is my responsibility, based on my audit, to form an independent opinion on the financial statements presented to me by the Institute and to report on them.

I review whether the statement on the system of internal financial control on pages 1 and 2 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.

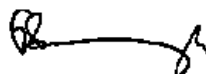
An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgments made in the preparation of the

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 Radiological Protection Institute of Ireland at 31 December 2002 and of its income and expenditure for the year then ended.



Gerard Smyth

For and on behalf of the Comptroller and Auditor General
17 November 2003

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

Key Control Procedures

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

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

In 2003, the Board established formal processes to identify and evaluate business risks by

- identifying the nature, extent and financial implication 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.

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. A feature of this is the provision to the Board of an annual report of the 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.

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 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.

Annual Review of Controls

I confirm that in the year ended 31 December 2002 the Board had conducted a review of the effectiveness of the system of internal financial controls.

No material weaknesses were identified in the system of internal financial controls during the year either by the board, the internal audit service or the Audit Committee.



FJ Mulligan
Chairman
Signed on behalf of the Board
22 October 2003

Statements of Responsibilities of The Institute & of Accounting Policies

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.



Francis J Mulligan
Chairman



F Turvey
Board Member

Statement of Responsibilities of the Institute

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 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 used are as follows:

Office & Laboratory, Furniture & Equipment:	20%
Motor Vehicles:	20%

Leasehold Improvements are depreciated over the life of the lease.

4. Superannuation

A Superannuation Scheme under Section 14 of the Nuclear Energy (An BO] 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 license fee income paid in advance by licensees in respect of future periods.

Income and Expenditure Account

For the year ended 31st December 2002

2001 Euro	Income	2002 Euro
2,641,055	Oireachtas Grant in Aid	2,715,000
(9,778)	Transfer to Capital Account (NOTE 2)	(13,976)
<u>2,631,277</u>		<u>2,701,024</u>
238,325	Dosimetry	266,721
234,633	Product Certification	171,106
166,233	Contract Income	134,345
124,319	License Fees	128,713
768	Interest Income	3,376
78,720	Other Income	188,679
<u>842,998</u>		<u>892,940</u>
<u>3,474,275</u>		<u>3,593,964</u>

2001 Euro	Expenditure	2002 Euro
1,828,618	Salaries and Pensions (NOTE 3)	2,215,883
144,995	Dosimetry & Regulatory Service	178,073
69,434	Library & Information Service	54,194
53,231	Radon	28,058
29,469	Emergency Plan	47,948
97,285	Environmental Monitoring	109,235
403,755	Accommodation & Insurance (NOTE 4)	408,645
118,284	Travel & Subsistence	137,317
127,374	Telephone, Postage & Office Supplies	134,097
94,067	Recruitment & Training	65,820
50,625	Miscellaneous including Professional Fees	40,721
9,750	Audit Fees	10,950
<u>279,099</u>	Depreciation (NOTE 1)	<u>320,552</u>

3,305,986		3,751,493
<u>168,289</u>	Surplus/ (Deficit) For Year	<u>(157,529)</u>
<u>321,203</u>	Balance at 1 January	<u>489,492</u>
489,492	Balance at 31 December	331,963

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 7 form part of these Financial Statements.



Chairman: Francis J Mulligan

Date: 22 October 2003



Board Member: F Turvey

Date: 22 October 2003

Balance Sheet

Balance Sheet as at 31st December 2002

2001 Euro	Income	2002 Euro
1,005,153	Fixed Assets	1,019,531
	Current Assets	
597,603	Cash on Hand & at Bank	389,773
262,718	Debtors and Prepayments	172,217
<u>860,321</u>		<u>561,990</u>

2001 Euro	Creditors - Amounts falling due within one year	2002 Euro
(217,475)	Creditors & Accruals	(115,035)
(152,952)	Income in Advance	(114,992)
(370,427)		(230,027)
489,894	Net Current Assets	331,963
<u>1,495,047</u>	Net Assets	<u>1,351,494</u>

	Financed by:	
489,492	Income & Expenditure Account	331,963
1,005,555	Capital Account	1,019,531
<u>1,495,047</u>		<u>1,351,494</u>

The Statement of Accounting Policies and notes 1 to 7 form part of these Financial Statements.



Chairman: Francis J Mulligan

Date: 22 October 2003



Board Member: F Turvey

Date: 22 October 2003

Notes to the Financial Statements

For the Year Ended December 2002

1. Tangible Fixed Assets

Cost:	Leasehold Improvements Euro	Office & Laboratory Furniture & Equipment Euro	Motor Vehicles Euro	Total Euro
At 1st January 2002	788,301	4,414,621	22,112	5,225,034
Additions	–	343,775	–	343,775
Disposals	–	–	(22,112)	(22,112)
At 31 December 2002	<u>788,301</u>	<u>4,758,396</u>	<u>–</u>	<u>5,546,697</u>
Depreciation:				
At 1st January 2002	352,845	3,853,769	13,267	4,219,881
Charge for year	25,617	294,935	–	320,552
On disposals	–	–	(13,267)	(13,267)
At 31 December 2002	<u>378,462</u>	<u>4,148,704</u>	<u>–</u>	<u>4,527,166</u>
Net Book Value at				
31 December 2001	<u>435,456</u>	<u>560,852</u>	<u>8,845</u>	<u>1,005,153</u>
Net Book Value at	409,839	609,692	–	1,019,531
31 December 2002				

2. Capital Account

	2002 Euro
Balance at 1 January 2002	1,005,555
Transfer from Income and Expenditure Account:	
Grants allocated for Capital Purposes	343,775
Amount released on the disposal of fixed assets	(8,845)
Amortisation in line with asset depreciation	(320,552)
Adjustment in respect of previous year	<u>(402)</u>
	13,976
Balance at 31 December 2002	<u>1,019,531</u>

Notes to the Financial Statements For the Year Ended December 2002

3. Salaries and Pensions

	2002 Euro
Gross Salaries	2,254,718
Employers P.R.S.I.	75,628
Pension Deductions	(114,463)
	<u>2,215,883</u>

Breakdown of Salaries and Pensions

Administration	558,262
Regulation/Dosimetry/Licensing	553,693
Environmental Monitoring	406,475
Information/Radon	440,125
Emergency Plan	185,526
Nuclear Safety	71,802
Charged to Income & Expenditure Account	<u>2,215,883</u>

The average number of full-time permanent persons employed, excluding Board members, in the financial year was 45 (2001-45).

Pension payments amounted to €265,625 (2001 - €59,328)

4. Commitments and Lease Obligations - Operating Leases

3 Clonskeagh Square

Lease commitments payable in the next 12 months amount to 247,599 euro on the basis of current rental rates and comprise rental payments on a leasehold interest, the term of which express on 1 October 2018. The rental is subject to review at five-yearly intervals. The last such review was 1 October 1988.

Floor 1, Block 1, 1 Clonskeagh Square

Lease commitments payable in the next 12 months amount to 17,500 euro 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. Board Members' Interest

The Board adopted procedures in accordance with guidelines issued by the Department of Finance in relation to the disclosures 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.

6. 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 valuation of defined benefit schemes used for the purposes of FRS 17 disclosure has been carried out by an independent actuary in order to assess the liabilities at the balance sheet date.

The financial assumptions used to calculate the retirement liabilities and components of the defined benefit cost for the year ended 31 December 2002 under FRS were as follows:

Valuation method	Projected Unit
Discount Rate	5.5%
Inflation Rate	4.0%
Salary Increases	4.0%
Pension Increases	4.0%

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

Current Service Cost	€285,000
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Analysis of the amount which would be credited to other Finance Income is as follows:

Interest on scheme liabilities	€421,000
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Analysis of the amount which would be recognised in the statement of total recognised gains and losses (STRGL) is as follows:

Experience gains and losses arising on the Scheme Liabilities	(1000)
Changes in assumptions	<u>0</u>
Actuarial loss which would be recognised in the STRGL	(1000)

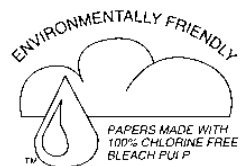
Analysis of the movement in deficit during the year is as follows:

Unfunded Accrued Liabilities at beginning of the year	(7,524,000)
Current Service Cost	(285,000)
Employer Contributions	27,000
Other Finance Income	(421,000)
Actuarial Gain	<u>(1,000)</u>
Unfunded Accrued Liabilities at end of the year	(8,204,00)

The above calculations are included for information only. ERS 17 requires full recognition of pension scheme assets/liabilities in the financial statement for periods ending on or after 1 January 2005.

7. Approval of Financial Statements

The financial statements were approved by the Board on 22 October 2003.



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