CONVENTION ON NUCLEAR SAFETY

NINTH NATIONAL REPORT BY IRELAND

August 2022

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A. INTRODUCTION

This report gives an outline of the national policy, State institutional framework and general legislation governing nuclear matters in Ireland. It also sets out measures adopted by Ireland to implement the relevant obligations of the Convention on Nuclear Safety.

Overview of Ireland's policy on nuclear safety

Ireland currently meets its electricity requirements from a combination of thermal and renewable energy sources. Ireland has chosen not to develop a nuclear power industry[1] and the Government has no plans for a change of policy in this respect. Factors informing the formation of this policy include concerns about public health and safety, environmental protection and security, as well as concern at the continued absence of an acceptable solution to the problem of the long-term management of the large quantities of radioactive waste produced by nuclear power stations.

Ireland has:

- No nuclear power stations.
- No defence reactors for research or other purposes.
- No spent nuclear reactor fuel in storage or awaiting treatment and no associated spent fuel reprocessing facilities of any sort.
- No trans-boundary movement of spent nuclear fuel from other countries across its territory, nor through its territorial waters.

Moreover, Ireland has no civilian research reactors (including those for production of isotope sources, any requirements for which are met by importing sources in a readymade form).

While Ireland does not have a nuclear power industry, it recognises the right of States to determine their own energy mix. It is our expectation that, where a State chooses to develop a nuclear power industry, this will be done in line with the highest international standards with respect to safety and environmental protection.

Ireland's policy priorities concentrate on improving nuclear safety and radiological protection and on emergency preparedness. This involves close contact with regulatory authorities in other

[1] Section 18, subsection 6 of the 1999 Electricity Regulation Act states that *"An order under this section shall not provide for the use of nuclear fission for the generation of electricity."* In addition, Nuclear power stations cannot be authorised under The Planning and Development (Strategic Infrastructure) Act 2006. These Acts would have to be amended by Government before any change in policy in relation to the generation of electricity by nuclear fission could take place.

countries. Ireland also participates in a number of IAEA, OECD-NEA and EU committees and working groups on a range of issues relating to nuclear safety.

The national policy position in the area of nuclear safety and radiation protection is a process of continual improvement and modifications are regularly required to adapt to changing circumstances. Responsibility for nuclear policy is vested in the Minister for Environment, Climate and Communications who has responsibility for:

- Implementing national policy in relation to nuclear and radiation matters.
- The transposition into national legislation of all relevant EU and other international legal instruments.
- Development of the national nuclear emergency plan.
- Representation at EU, IAEA and other international organisations.

The Regulatory Body for matters relating to ionising radiation in Ireland is the Environmental Protection Agency (EPA). The EPA is the designated competent authority for public and worker protection.

Ireland's commitment to the Convention on Nuclear Safety

The Convention on Nuclear Safety (CNS) is important to Ireland. It recognises that nuclear safety is a matter for all of us. While specific safety provisions remain, in the first instance, a matter for each country, the potential transboundary impact of a nuclear accident means that nuclear safety in any one country is a matter of concern to all others, whether or not they have chosen to develop a nuclear energy industry of their own. The risks to human health and the environment that a nuclear accident carries, and the possible transboundary consequences mean that international cooperation is essential to provide assurance, including to the public, that the right measures are in place and that they are effectively implemented.

Transparency and effective communications are an essential part of nuclear safety and emergency response. One aspect of this to which Ireland attaches particular importance is effective communication between governments and the CNS encourages States to provide appropriate information to the Competent Authorities of other States in the vicinity of a nuclear installation for emergency planning and response. Ireland places great importance on the CNS review process and looks forward to working with all other Contracting Parties to ensure the CNS is effective and that the co-operation developed between Contracting Parties to date continues to improve.

Structure of the report

The format of the Irish National Report follows the structure given in guidelines INFCIRC/572/Rev.6.

B. SUMMARY

The main developments since the last national report are:

- Ireland transposed the Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation ("the BSS") into Irish Law through Statutory Instrument 30 of 2019, the Radiological Protection Act 1991 (Ionising Radiation) Regulations 2019 and Statutory Instrument 256 of 2018, European Union (Basic Safety Standards Arising from Medical Exposure to Ionising Radiation) Regulations 2018.
- The introduction of a graded authorisation system in accordance with the new Ionising Radiation Regulations.
- A review and update of the National Emergency Plan for Nuclear Accidents (NEPNA) to a new National Plan for Nuclear and Radiological Exposures by the Department of the Environment, Climate and Communications (DECC). The National Plan was reviewed by the Government Task Force on Emergency Planning and received ministerial approval.
- The OECD conducted a review of the EPA's institutional and organisational set-up. The purpose of the review was to assess and strengthen the organisational performance and governance of the EPA. This review was published in 2020. One of the recommendations of the review was to streamline the internal structure of the organisation for efficiency and cohesiveness gain with the goal of bringing together functions that are currently dispersed. As a result of this recommendation, the enforcement functions of the organisation were centralised into one Office, which has resulted in the Radiation Protection Regulation Unit being moved from the Office of Radiation and Environmental Monitoring to the Office of Environmental Enforcement.
- Ireland hosted an IAEA IRRS review mission in 2015 and the final report was presented to Ireland in February 2016. This report included a series of explicit recommendations, suggestions and and an Action Plan was developed to address these findings as well as other significant issues identified during the self-assessment phase of the IRRS process. Ireland has now implemented all of the recommendations set out in the Action Plan from the 2015 IRRS mission.
- Ireland hosted an IAEA ARTEMIS peer review mission in October 2021, with the ARTEMIS review team noting that Ireland has demonstrated a strong commitment to the safe management of disused radioactive sources and radioactive waste. The ARTEMIS review team made two recommendations and five suggestions with a view to improving the safe management of radioactive waste in Ireland. An action plan has been developed to address the recommendations and suggestions and is currently being implemented.

Challenges identified at last Review Meeting

Three challenges were identified in the country review report for Ireland at the seventh peer review meeting. The challenges identified were as follows:

- Implementation of the National IRRS Action Plan
- Transposition of Euratom BSS Directive by February 2018, including the introduction of a graded authorisation system.
- Maintenance of expertise and succession planning in the regulatory body.

No suggestions were identified for Ireland during the 7th CNS Review Meeting.

Implementation of the National IRRS Action Plan

Ireland hosted an IAEA IRRS review mission in 2015 and the final report was presented to Ireland in February 2016. This report set out the review team's assessment of Ireland's compliance with the IAEA's Fundamental Safety Principles and Safety Requirements and included a series of explicit recommendations, suggestions and good practices.

An Action Plan was developed to address the IRRS findings as well as other significant issues identified during the self-assessment phase of the IRRS process. Ireland has now implemented all of the recommendations set out in the Action Plan from the 2015 IRRS mission.

Transposition of the Euratom BSS Directive by February 2018, including the introduction of a graded authorisation system.

The European BSS Directive was transposed into irish law through new regulations: Statutory Instrument 30 of 2019: Radiological Protection Act 1991 (Ionising Radiation) Regulations 2019 (IRR 2019) and Statutory Instrument 256 of 2018: European Union (Basic Safety Standards Arising from Medical Exposure to Ionising Radiation) Regulations 2018. These new regulations introduced a number of changes in the way in which ionising radiation is regulated in Ireland.

IRR 2019 established a graded approach to authorisation comprising of both registration and licensing. This new graded system replaced the older licence-based system established under earlier regulations. In order to legally carry out any practice involving the use of radioactive sources or ionising radiation producing equipment, it is necessary to obtain an authorisation in advance from the EPA, unless the practice has been specifically exempted. The form of authorisation (registration or licensing), which applies in a given situation, will depend on the magnitude and likelihood of any exposures resulting from the practices and the impact that regulatory control may have in improving radiological safety. The EPA has published a list of Practices subject to Registration and a list of Practices subject to Licensing on its website (https://www.epa.ie/radiation/regulation/authorisation/).

Practices that are subject to registration include, for example, dental radiography using an intra/external oral unit, general veterinary radiography (carried out in a risk assessed veterinary clinic) and carriage of sources other than High Activity Sealed Sources.

The transposition of the Euratom BSS Directive also introduced a number of changes in the way ionising radiation is regulated in Ireland. Some key changes include:

- Patient Protection: Responsibility for patient protection has been assigned to a new national regulator: the Health Information and Quality Authority. This role is governed by the European Union (Basic Safety Standards Arising from Medical Exposure to Ionising Radiation) Regulations 2018; (S.I. 256 of 2018)
- Regulatory fees: A new fee structure has been introduced in tandem with graded authorisation and was transposed into law by Radiological Protection Act 1991(Authorisation Application And Fees) Regulations 2019 (S.I. No 34 of 2019). The new fee structure has been designed so that the charges are proportionate to level of risk associated with the type of practices being carried out. The new fees include separate authorisation and enforcement elements. Authorisation fees will apply when an application is made to carry out a new practice or to significantly modify an existing practice. Enforcement fees will apply to licensed practices and will be charged annually. Enforcement fees are intended to cover the costs associated with guidance, inspection and licence amendments.
- Dose limit for the lens of the eye: IRR 2019 introduce a reduced dose limit for occupational exposure to the lens of the eye. The new limit on the equivalent dose for the lens of the eye is 20 mSv in a single year or 100 mSv in any five consecutive years subject to a maximum dose of 50 mSv in a single year.
- Strengthened arrangements for outside workers: IRR 2019 changed the definition of an "outside worker" to mean “any exposed worker who is not employed by the undertaking responsible for the supervised and controlled areas, but performs activities in those areas, including apprentices and students”. Currently only category A workers not employed by the undertaking are considered to be outside workers. As a consequence of the Regulations a greater number of exposed workers will fall within the definition of outside worker.
- Changes to the Radiation Protection Officers (RPO) and Radiation Protection Adviser (RPA) roles: The IRR 2019 set out a more defined role for Radiation Protection Officers (RPO). The RPO will be an individual or unit reporting directly to the undertaking with operational responsibility for radiation protection. The new Regulations require the RPA to be consulted on specified situations.

- Disposal of Unsealed Sources: IRR 2019 no longer permit the deliberate dilution of radioactive materials for the purpose of them being released from regulatory control. The mixing of materials that takes place in normal operations where radioactivity is not a consideration is not subject to this prohibition. The EPA may in certain circumstances authorise the mixing of radioactive and non-radioactive materials for the purposes of reuse or recycling.
- Radon: IRR 2019 introduce more stringent protections for workers in workplaces with high indoor radon levels and in activities processing naturally occurring radioactive material (NORM). The national reference level for radon levels in workplaces will decrease from 400 Bq/m^3 to 300 Bq/m^3. Under the new regulations there is a general duty on employers to carry out radon measurements in underground workplaces and in above ground workplaces identified as being liable to have high radon levels (based on the EPA's radon risk map).
- Emergency Preparedness: IRR 2019 introduce new requirements for undertakings responsible for certain types of practice covering their emergency arrangements.

Maintenance of expertise and succession planning in the regulatory body.

The regulatory body, the EPA, offers an extensive range of support to all staff to assist them to perform and develop in their current role and prepare for future roles and to improve the depth of skills and knowledge across the organisation to support the delivery of the EPA's mandate and strategic goals. This commitment is reflected in an expenditure for learning and development, which represents approximately 2.5% of payroll spend. Since the last review meeting, EPA staff participated in many events, including training courses, workshops, conferences and seminars. These events are also opportunities for informal learning, which the EPA sees as essential for learning. An annual Learning & Development Plan is aligned to support the achievement of EPA goals, whilst also supporting team and individual development needs.

The EPA also developed a Human Resource Development (HRD) Strategy with the overall aim to 'become a role model for the stewardship and development of our people and organisational resources'.

EPA identified four strategic goals under its HRD strategy that provided a clear focus for the work of the EPA and through these the EPA committed to: fostering a healthy, engaged, and resilient workforce; developing people and organisational resources; empowering managers as experts and leaders; and evolving the HR delivery model.

The strategic priorities identified under developing our people and organisational resources included actions related to IRRS Mission findings, specifically to:

- Develop an integrated view of workforce planning and resource management that incorporates staff and contractors. This has been addressed through the preparation of an annual workforce plan assessing staffing needs and identifying priority new posts.
- Develop a succession management plan that addresses critical posts due to become vacant in the years ahead. Succession planning is conducted as part of the EPA HR team business partner process that identifies critical posts due to become vacant in the EPA in consultation with Senior Managers in each Office.

The EPA's strategic plan (2022 – 2026) outlines a number of strategic outcomes that set out what the organisation intends to achieve over the next five years. Under the 'Culture of Excellence' strategic outcome the organisation is committed to maintaining and enhancing capacity, expertise and skillsets to ensure resilience and deliver strategic outcomes. In 2022, the programme of work planned by the EPA's People and Organisation Development Unit includes projects that will implement a new Learning Management System and leadership programmes and establish a new coaching framework and mentoring programme,

Furthermore, the EPA has identified the need to maintain specific expertise in the areas of radiation protection and nuclear safety. The EPA is currently undertaking a review of radiation skillsets in the organisation with a view to implementing specific actions to ensure these skillsets are maintained and developed into the future.

Major Common Issues identified by the 7th Review Meeting

As Ireland has no nuclear facilities, only seven of the nine major common issues identified by the 7th Review Meeting are applicable:

- Issue 1: Safety Culture
- Issue 2: International Peer Review
- Issue 3: Legal Framework and Independence of the Regulatory Body
- Issue 4: Financial and Human Resources
- Issue 5: Knowledge Management
- Issue 8: Emergency Preparedess
- Issue 9: Stakeholder Consulation and Communication

Issues 6 and 7 were related to Supply Chain and Ageing management of nuclear facilties.

Issue 1: Safety Culture

The EPA's Radiation Protection Regulation Unit ensures that emphasis is placed on the assessment of licensees' radiation safety culture during its inspections. This involves communicating with staff at all levels within the organisation during inspections including Senior managers, radiation protection professionals & operational staff and assessing that effective

systems and processes are in place to support a positive radiation safety culture within the organisation. The importance of radiation safety culture was emphasised in the recently published EPA Guidance on the application IRR 2019. In particular the guidance specifies that *"undertakings must demonstrate an understanding of and commitment to radiation protection and work with its staff to create and maintain a good radiation safety culture within the organisation"*.

Issue 2: International Peer Review

Details on the actions taken since the last review meeting are outlined earlier in the Summary Section and include an IAEA ARTEMIS Mission and an OECD review of the EPA's institutional and organisational set-up.

Issue 3 and 4: Legal Framework and Independence of the Regulatory Body and Financial and Human Resources

The Regulatory Body for matters relating to ionising radiation in Ireland is the Environmental Protection Agency (EPA). The EPA is the designated competent authority for public and worker protection. The legal framework for the Regulatory body is outlined in Article 7(1).

Within the EPA, the Office of Environmental Enforcement (OEE) is responsible for the regulation of ionising radiation. The Office of Radiation Protection and Environmental Monitoring (ORM) has the responsibility for monitoring and advising in matters pertaining to ionising radiation, which includes radon, radiation monitoring, emergency preparedness, calibration and nuclear safety. There are approximately 21.1 full time equivalent staff in the EPA directly involved in radiation protection.

The EPA is an independent public body that reports to Government and is partially funded by the Exchequer. Staff competence within the EPA in radiological protection is maintained under a Performance Management and Development System (PMDS) and annual Work Programme planning where competence and capacity is taken into account. Additionally, there is a process of 'Workforce Planning' where competency and capacity needs for the organization as a whole are identified.

The EPA's income is made up of grants from the Exchequer and Earned and Other Income which includes Environmental Licensing and Enforcement, recovery of Emissions Trading Unit Costs, Regional Laboratory services and income from Radiological activities. In 2021, the EPA's income of €76.741M was made up of a grant of €54.988M from the Exchequer, and included earnings of €0.764M from Radiological Activities that included licence fees and charges for instrument calibration, product certification, radon and radiation measurement and related services.

The on-going financial, human resource, and research and development requirements of the EPA are supported through the normal annual budgeting and workforce planning processes exercised between the Department of Environment, Climate and Communications and agencies under its aegis.

Issue 5: Knowledge Management

Details on the actions taken since the last Review meeting are outlined earlier in the Summary section under 'Maintenance of expertise and succession planning in the regulatory body'.

Issue 8: Emergency Preparedness

Details on the actions taken since the last Review meeting are outlined under Article 16.

Issue 9: Stakeholder Consulation and Communication

In 2021, the EPA conducted a survey exploring Irish attitudes towards radiation and found that 28 per cent of people are concerned about radiation. A nationally representative sample of over 1,000 adults found that nearly three in ten adults are concerned about radiation with one of the main concerns being how nuclear plants abroad affect Ireland.

In 2022, the EPA reviewed its engagement with regulatory stakeholders. The review included identifying and categorising key stakeholders, specifying the purpose/desired outcomes of the engagement and the preferred mechanisms. A number of stakeholder events have been planned for 2022 including a Radiation Protection Adviser Liaison Day, a Radiation Protection Officer study day and an online meeting with Senior management representatives of licensees, which is a new initiative.

In addition, details on the actions taken since the last Review meeting related to stakeholder engagement in the area of emergency preparedness and response is outlined under Article 16 under 'Ireland's Food and Feed Stakeholder Engagement Panel'.

Future safety related activities and programmes planned or proposed for the period until the next National Report

A new National Plan for Nuclear and Radiological Exposures ("the National Plan") has been developed by the Department of Environment, Climate and Communications[2]. This National Plan outlines the framework for response to a large scale nuclear or radiological emergency in Ireland and replaces the previous National Emergency Plan for Nuclear Accidents published in 2005.

[2] The National Plan for Nuclear and Radiological Exposures (2019), https://www.gov.ie/en/publication/96b67-national-plan-for-nuclear-and-radiological-emergency-exposures/

The last national level exercise took place in 2017 before the introduction of the new National Plan, therefore, the next national exercise, due to be held in September 2022, will provide an opportunity to test the elements of the new National Plan to ensure its effectiveness and to test the arrangements for co-ordinating a 'whole of Government' response to an emergency exposure situation.

C. REPORTING ARTICLE BY ARTICLE

Article 4 Implementing Measures

These measures are set out in this Report.

Article 5 Reporting

The submission of this National Report fulfils this obligation.

Article 6 Existing Nuclear Installations

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 7 Legislative and regulatory framework

Article 7 (1) Establishing and maintaining a legislative and regulatory framework

Ireland is a member of the European Union, therefore its regulatory framework with respect to ionising radiation and nuclear safety is based on relevant EU Directives and Regulations.

The framework legislation governing the nuclear and radiation protection sectors in Ireland is the Radiological Protection Act, 1991 as amended. This Act repealed the Nuclear Energy Act, 1971. Under the 1991 Act, the Minister for the Environment, Climate and Communications has Ministerial responsibility in relation to nuclear and radiological protection matters.

Within the Department of Environment, Climate and Communications (DECC), there is a dedicated Air Quality, Noise and Environmental Radiation Protection Division, whose responsibilities include:

- Policy development and advice to Government in relation to nuclear matters;
- Transposition into national legislation of relevant EU and other international instruments;
- Representation at meetings of the EU, IAEA and other international organisations.

The Air Quality, Noise and Environmental Radiation Protection Division is assisted in these activities by the Environmental Protection Agency.

The Radiological Protection (Miscellaneous Provisions) Act No 20 of 2014 provides for the merger of the Environmental Protection Agency (EPA) and the Radiological Protection Institute of Ireland (RPII) establishing the EPA as the national regulatory body with the radiation protection functionality being exercised on a day to day basis by the Office of Environmental Enforcement (OEE) and Office of Radiation Protection and Environmental Monitoring (ORM).

Radiological Protection Act, 1991 (Ionising Radiation) Regulations 2019 (S.I. No. 30 of 2019), was made under Section 30 of the Radiological Protection Act of 1991 and gives legal effect in Ireland

to EU Council Directive 2013/59/Euratom of 5 December 2013, which lays down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation. Under S.I. No. 30 of 2019, all activities involving radioactive sources, save those which meet the criteria for exemption specified in the S.I., require an authorisation from the EPA. In addition, the Radiological Protection Act, 1991 (Ionising Radiation) Regulations 2019 (S.I. No. 30 of 2019) gives effect to Council Directive 2003/122/EURATOM on the control of high activity sealed radioactive sources and orphan sources.

The Radiological Protection Act, 1991, as amended, sets out the functions of the EPA as well as the legislative powers of the Minister for the Environment, Climate and Communications in the areas of nuclear safety and radiological protection. The Act also provides for the implementation of future European Union legislation in the area of radiation protection and nuclear safety by means of Ministerial Order. It also sets out specific functions of the Food Safety Authority of Ireland, principally in regards to the protection of individuals from radiological hazards in food and responsibilities of other Government Ministers.

In addition to the Radiological Protection Act, 1991 (Ionising Radiation) Regulations 2019 (S.I. No. 30 of 2019) the key Irish legislation directly or indirectly relating to nuclear matters and radiological protection includes the following:

- European Communities (Nuclear Safety) Regulations 2017 (S.I. No. 332 of 2017)
- Radiological Protection (Miscellaneous Provisions) Act (No 20) of 2014
- Radiological Protection Act, 1991 (Nuclear Safety) Order, 2011 (S.I. No. 390 of 2011)
- European Communities (Supervision and Control of Certain Shipments of Radioactive Waste and Spent Fuel) Order, 2009 (S.I. No. 86 of 2009)
- Radiological Protection Act 1991 (Authorisation Application and Fees) Regulations 2019 (S.I. No 34 of 2019).
- Health Act, 1953 (No. 26 of 1953).
- Safety, Health & Welfare at Work Act, 2005 (No. 10 of 2005).
- Dumping at Sea Act, 1996 (No. 14 of 1996).
- Harbours Act, 1996 (No. 11 of 1996), as amended by the Harbours (Amendment) Act 2000 (No. 21 of 2000).
- Containment of Nuclear Weapons Act 2003 (No. 35 of 2003).
- Nuclear Test Ban Act 2008 (No. 16 of 2008).
- Electricity Regulation Act 1999 (Single Electricity Market) Regulations 2007 to 2017 (S.I. No. 3 of 2017)
- Environmental Protection Act 1992 (No. 7 of 1992)

In July 1996, Ireland ratified the Convention of Nuclear Safety, triggering the entry into force of the Convention. Ireland has also ratified the Joint Convention on the Safety of Radioactive Waste and the Safety of Spent Fuel Management in March 2000 as well as the Convention on the Physical Protection of Nuclear Materials (CPPNM)[3] in 1991 and is subject to the terms of these Conventions.

Also relevant is the Freedom of Information Act, 1997 which contains an amendment to Section 36 of the Radiological Protection Act 1991. The amendment deals with confidentiality.

Article 7 (2) (i) National safety requirements and regulations

National safety requirements and regulations are set out in IRR 2019, which implement the Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation. The EPA's Office of Environmental Enforcement (OEE) and the Office of Radiation Protection & Environmental Monitoring (ORM) are responsible for implementation of a system of regulatory control covering these requirements and regulations.

The system of regulatory control comprises: authorisation (licensing and registration), compliance assurance (including inspections), guidance and enforcement. The EPA has produced guidance documents and codes of practice for undertakings which are available on its website (https://www.epa.ie/our-services/licensing/radiation/graded-authorisation/)

Article 7 (2) (ii) System of licensing

IRR 2019 established a graded approach to authorisation comprising both registration and licensing. This new graded system replaces the older licence based system established under earlier regulations.

Applicants can now apply for either an indefinite registration certificate or a licence which is valid for ten years. Further information on the graded approach can be found in Section B: Challenges identified at last Review Meeting. Figures for the numbers of licensed and registered undertakings are given in Table 1. Figure 1 shows the distribution of authorisations by sector.

Table 1. Number of licensed and registered undertakings (2022)

Authorisation Type	Number	Percentage
Licensing	266	15%
Registration	1477	85%
Total	1743	

[3] The Amendment to the Convention on the Physical Protection of Nuclear Material in 2005 is addressed under the Radiological Protection (Miscellaneous Provisions) Act (No 20) of 2014

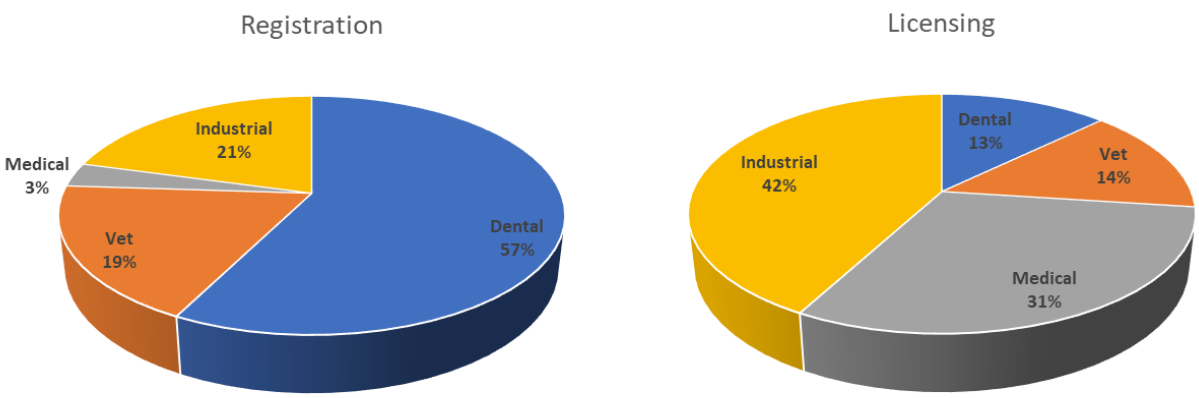

Figure 1. Distributions of Authorisations by Sector (2022)

Article 7 (2) (iii) System of regulatory inspection and assessment

The EPA's inspection programme is an essential component of the EPA's regulatory processes which ensures that all sources of ionising radiation are held and used safely and securely.

Regulation 81 of IRR 2019 requires the EPA to establish and maintain a system of inspection to enforce the provisions of those Regulations. The legislation doesn't specify the scope or frequency of site inspections at licensed facilities.

In fulfilment of this obligation, EPA inspections are designed to assess compliance with national Regulations and any conditions attached to a registration or licence. The inspection programme also aims to assess the standard of radiation protection in place at each licensed facility and to encourage licensees to strive to attain best practice in relation to radiation protection.

Inspection planning takes a risk based approach to developing its annual inspection programme, investing greatest resources in those activities with the highest risks. In assessing the level of risk, account is taken of:

- The number of practices licensed and the level of complexity of the practice(s);
- The type, size, number and complexity of the radioactive source or irradiating apparatus;
- The security and safety measures required;
- The complexity of radiation protection measures required;
- The potential for doses arising to workers or members of the public;
- Consequences of an accident.

When planning the annual inspection programme account is taken of the following:

- Radiological risk associated with each facility;
- Date of most recent inspection;
- Number of authorisations within each category;
- Reported incidents during the year;
- Issues related to individual facilities;
- Matters that may have arisen during the year;
- Deferred inspections from previous years, where relevant;
- Recommendations from all inspectors or other relevant personnel;
- A policy direction from the Board of the EPA.

For its 2022 annual inspection programme, the EPA is focussing on implementation of new Regulations and IRR19 guidance across all sectors. The EPA are also investigating other models of compliance assurance to complement the inspection programme including self-assessment questionnaires for dental radiography and on-site veterinary radiography.

The EPA has the resources to undertake approximately 80 radiological inspections per year and an annual inspection plan is developed taking into account the factors outlined above.

The Radiation Protection Regulation Unit of the EPA Office of Environmental Enforcement regulates approximately 266 licensed facilities conducting radiological practices.

The total number of planned inspections in 2022 is 73, which includes 33 industrial licensees, 23 hospitals, 8 vets, 4 distributors/transport companies, 3 dentists and 2 universities. In addition, 7 security audits will be undertaken with An Garda Síochána (Police) to assess security arrangements at licensed sites using radiation sources (IAEA Risk Category 2-4).

EPA typically conduct most inspections on-site, however, remote compliance assessments can be used in certain circumstances, for example, for non-Irish based licensees (where site inspections are logistically challenging to organise). The target of radiological protection inspections and the outcomes are listed in Table 2.

Table 2. Radiological Protection Inspection Targets and Outcomes 2022

Target of inspections	Outcomes Expected
Implementation of new Regulations and IRR19 guidance across all sectors	Risk Assessment in place in line with EPA guidance. Workers categorised correctly. Effective RPO arrangements in place. Adequate and appropriate training provided to staff.
Site industrial radiography using high activity sources - focus on source recovery training and equipment testing (QA)	Improved radiation protection practice on the ground. Reduced likelihood and impact of radiation incidents.
Cardiology and Interventional radiology – focus on personal dosimetry including eye dose	Increased compliance with dosimetry requirements as outlined in IRR 2019 and new guidance.
Sectoral focus on veterinary site radiography	Improved radiation protection practice on the ground.
Disused sealed sources in long term storage, awaiting disposal	Reduced number of disused sources on national inventory of radioactive waste.
Sites with poor compliance that require a follow-up inspection	Confirmation that licensees have returned to compliance.

Inspections can also arise outside of the normal annual programme where incidents are investigated.

The EPA is committed to ensuring the highest standards in all activities it undertakes. In fulfilment of this commitment all inspection activities are carried out within the framework of an ISO 17020 quality management system. This ensures that inspections are carried out to best international standards and ensures consistency between both inspections and inspectors. In particular the system provides for inspection planning, training of new and experienced inspectors, the conduct of inspections as well as post inspection follow up and review.

The regulatory function comprises ten whole time equivalent inspectors and support staff. In addition, external expert consultants are on occasion brought in to assist in specialist inspections. Inspections are carried out under the EPA's ISO 17020 Quality Management System and in all

cases the responsibility for determination of conformity of the facility being inspected will remain with the EPA inspector.

Inspectors are engaged in all regulatory activities in addition to inspection, including authorisation, drafting guidance documentation, accreditation activities, provision of advice to Government, radioactive waste management, management of Radiation Protection Advisor (RPA) registers, approval of courses, international representation, regulator/stakeholder liaison, policy and technical advice for legislation development.

Article 7 (2) (iv) Enforcement of applicable regulations and terms of licences

Failure to comply with either a regulatory requirement (IRR 2019) or a condition attached to an authorisation is an offence which can lead to prosecution. In addition, conducting a practice without an authorisation is an offence that can lead to a prosecution.

The EPA and its inspectors are provided with significant enforcement powers under the Radiological Protection Acts 1991 and the IRR 2019 including powers of entry and seizure. Prosecutions can and have been taken against individuals and companies involved in unauthorised activities and against non-compliant undertakings. Fines have been imposed by the courts on individuals and companies that are found guilty of an offence. In addition, the EPA has the power to issue enforcement notices and legally binding directions. It uses these powers where the appropriate standards of radiation protection are not upheld. Since the last reporting period there has been one prosecution taken. The EPA has responded to incidents involving orphan sources and has worked with all of the parties concerned to resolve the issues involved.

EPA inspectors also have substantial powers under the European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011 to 2018 that include powers of entry and seizure.

There is a range of enforcement tools available to the EPA inspectorate from 'soft' actions to 'hard' actions including:

- Raising non compliances during routine inspections and follow up until there is satisfactory closure;
- Letter of censure/warning letter;
- Issuing a legally binding direction;
- Issuing an enforcement notice;
- Seizure of relevant items such as radioactive sources/orphan sources;
- Suspension of an authorisation;

- Revocation of an authorisation;
- Prosecution (and subsequent penalties/fines).

In accordance with the Radiological Protection Act, where an inspector is of the opinion that there is or may be a danger to any individual, land, building or other property arising from a radioactive substance, nuclear device or irradiating apparatus or arising from levels of activity or ionising radiation in excess of the specified levels the inspector can order persons to perform or refrain from performing any act if, in his/her opinion, the performance of such act (as the case may be) is necessary in order to prevent or alleviate the escalation of the danger.

Regarding implementation of corrective actions identified during an inspection, the Inspection Report is issued to licensee management within four weeks of the date of the inspection and this includes a response date of four weeks by which the licensee must provide a written response to the report. If this is not provided then the inspectors follow up in accordance with the EPA's Compliance and Enforcement Policy.

Since the commencement of the regulatory system more than 50 prosecutions have been carried out for a range of offences including unlicensed custody of sources of ionising radiation, failure to adhere to a licence condition, unlicensed export of a radioactive substance (involving an inadvertent shipment of radioactive waste in general hospital waste to the UK) and obstructing an inspector. Where the EPA achieves a successful prosecution it issues a press release.

Article 8 Regulatory body

Article 8 (1) Establishment of the regulatory body

Legal foundations and statute of the regulatory body

The EPA is an independent public body that reports to Government and is partially funded by the exchequer. The EPA was established under the Environmental Protection Agency Act, 1992. Following the merger of the RPII and the EPA in August 2014, the functions and responsibilities of the RPII transferred to the EPA under the Radiological Protection (Miscellaneous Provisions) Act 2014 (S.I. No. 20 of 2014).

Mandate, mission and tasks

The mission of the EPA is set out in the EPA's strategic plan 2022 – 2026 and is as follows:

To protect, improve and restore our environment through regulation, scientific knowledge and working with others.

The EPA has the following duties and responsibilities in respect of radiation protection, nuclear safety and waste management:

- To provide advice to the Government, the Minister for the Environment, Climate and Communications and other Ministers on matters relating to radiological safety.
- To provide information to the public on any matters relating to radiological safety.
- To maintain and develop a national laboratory for the measurement of levels of radioactivity in the environment and to assess the significance of these levels for the Irish population.
- To regulate through system of licensing and registration practices involving the use of radioactive sources or equipment which produces ionising radiation.
- To exercise and assist in the development of national plans for emergencies arising from nuclear accidents and to act in support of such plans.
- To carry out or promote research in relevant fields.
- To monitor developments abroad relating to nuclear installations and radiological safety generally and to keep the Government informed of their implications for Ireland.
- To co-operate with the relevant authorities in other states and with appropriate international organisations.
- To represent the State on international bodies.
- To be the competent authority under international conventions on nuclear matters.
- Where appropriate, to provide, or oversee the provision of, specialist radiation protection services such as personal dosimetry, radioactivity measurement, instrument calibration, radon measurements and product certification.

The EPA has also been designated the national competent authority for the purposes of the IAEA Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and the Convention on Early Notification of a Nuclear Accident and is the National Authority responsible for the physical protection of nuclear material.

Organisational Structure

The EPA is managed by a full-time Executive Board consisting of a Director General and five Directors. Its activities are organised into five Offices, with each Director responsible for an Office: the Office of Environmental Sustainability, the Office of Environmental Enforcement; the Office of Evidence and Assessment; the Office of Radiation Protection and Environmental Monitoring; and the Office of Communications and Corporate Services. The EPA organisation structure is shown in Figure 2.

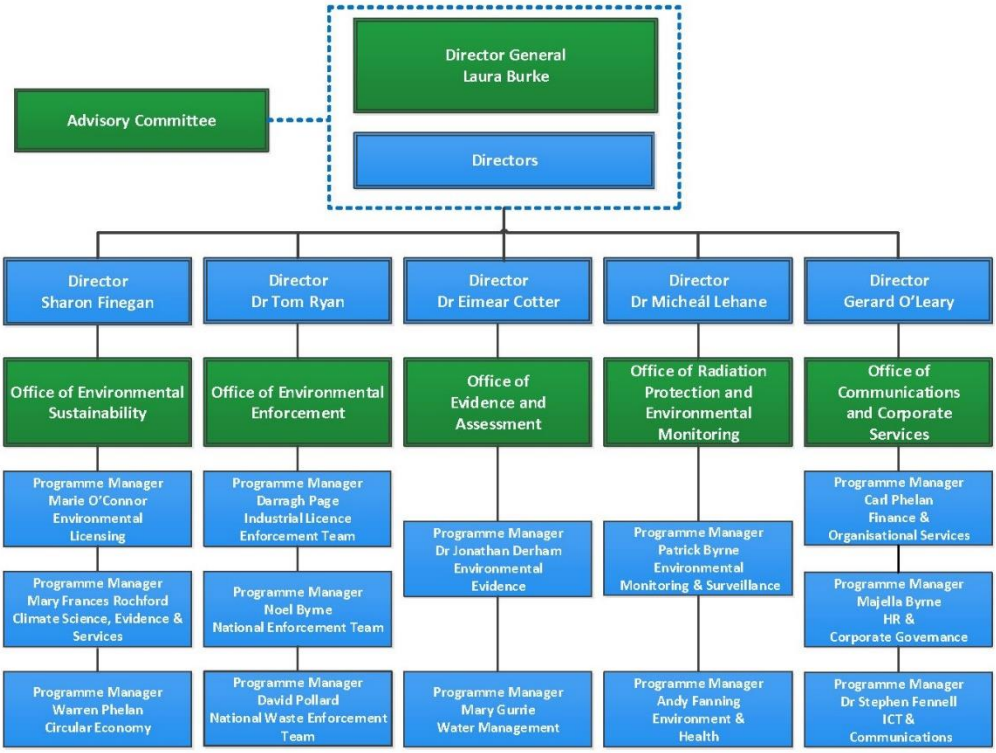

Figure 2. Organisation Chart for the EPA

In August 2022, the EPA has approximately 440 staff. Of this, there are 21.1 full time equivalent staff working in radiation protection and nuclear safety.

Advisory committees

The work of the EPA is further supplemented by a statutory advisory committee which provides advice to the EPA Board, in addition to a number of thematic advisory committees which advise the EPA in the carrying out of its functions. These include the Radiation Protection Advisory Committee and the Audit & Risk Committee.

The Radiation Protection Advisory Committee (RPAC) was established in 2015 after the merger of the Radiological Protection Insitute of Ireland (RPII) and the EPA and is made up of sixteen members. The purpose of the RPAC is to act as a high-level scientific body providing advice to the Agency in relation to its radiation protection functions. The membership of the Committee is drawn from a broad range of fields covering the range of EPA radiation protection activities. It includes representation from the EPA regulated sectors; experts from outside the State to provide for a broader international perspective; and also Non-Governmental Organisations who have an involvement and interest in radiation protection. Criteria for nomination are excellence and reputation in the members own field, as well as the contribution that they can make to the scientific

reach of the group as a whole. Following the expiry of the membership term of the first committee a new Radiation Protection Advisory Committee was formed in 2019 and the current membership is drawn from the fields of radiotherapy, nuclear medicine, diagnostic radiology, public health and public exposure, environmental radioactivity, nuclear safety, education, food safety, radiation research, workplace safety, dentistry, veterinary, and radon. The current committee includes three members from counterpart organisations abroad.The term of the second committee will shortly be completed and new members will be sought for the third committee.

The Audit & Risk Committee (ARC) has an independent role in the provision of assurance to the EPA Board on internal control, risk management, efficiency & effectiveness, audit and assurance matters, as part of the systematic review of the control environment and governance procedures of the EPA. The ARC operates under an agreed charter and is obliged to prepare a formal annual report for the EPA's Director General for submission to the Board.

Development and maintenance of competence

The EPA operates a Performance Management Development System (PMDS) for all staff where their contribution to the successful delivery of the annual work programmes and ultimately the EPA's strategic plan is managed. This ensures that the work of all staff is strategically aligned to the overarching aims of the organisation. As part of the PMDS programme, all staff meet with their line manager at the start of the year to agree and document their individual work programme for the year. During this meeting, training and development needs are identified and where possible these are addressed though either in-house or external training opportunities. Half way through the year a mid-year review meeting is held between the staff member and their line manager where progress on both the agreed work plan and the training & development programme are reviewed. Towards the end of the year an end of year review meeting is held to review whether the objectives of both the work and training & development plans were met during the year.

All new radiological inspectors joining the EPA must follow a comprehensive, documented training programme which ensures that they have both the technical knowledge and expertise, and over time the necessary experience, to ensure their effective independence in decision making. New inspectors are supported at all times by a mentor who they can consult with whenever they need advice or support in terms of decision making.

One of the requirements of the ISO 17020 standard is that the inspection body must have procedures in place to be able to assess the on-going competence of all its inspectors. To address this requirement a programme of inspection witnessing has been developed. Under this programme each inspector is witnessed, by his or her line manager, carrying out a series of

inspections at least once every two years. The competency assessment covers the entire range of activities associated with inspections, from the planning stages, through the actual inspection itself and finally the inspection reporting.

Quality management system

In 2009 the then RPII became the first regulatory authority in Europe engaged in radiation protection inspections to receive the certificate of accreditation under ISO 17020 from the Irish National Accreditation Board. This accreditation is now held by the EPA. It certifies that the EPA operates to the highest standards in carrying out radiation protection inspections, including inspection planning, follow-up and review, as part of an overall quality system that is subject to international peer review. To maintain this accreditation an annual audit of the system is carried out by the Irish National Accreditation Board.

Development and maintenance of human resources

The EPA implements a performance management and development system (PMDS) for all staff which includes a module on training and staff development. Training is organised either on an individual basis or in groups depending on the nature of and demand for the training. Training contracts are awarded to trainers who have a good reputation and experience in their field. Where Ireland does not have a large experience base in a given topic (e.g. reactor technology) training is often obtained abroad. Feedback is sought by the EPA's Human Resources department on the quality of training provided by third party trainers. This feedback is sought both from staff attending the courses and from HR personnel in other organisations.

The role of the EPA in emergency response includes the provision of technical advice and monitoring whereas emergency response coordination/incident management is provided by the Lead Government Department/Principal Response Agency. Hence, training for EPA staff is on these technical roles. The majority of the radiation protection and nuclear safety staff in the EPA are assigned an emergency role for a nuclear or radiological emergency based on their skills and experience. Assignments are decided by the manager responsible for emergency planning and approved by the ORM Senior Management Team. The training needs for different roles are set down in the 'EPA Nuclear and Radiological Emergency Plan' and 3-year staff training programmes are developed based on this. These programmes include a range of delivery methods including participation in drills and exercises, on-the-job training by colleagues, attendance at internationally-organised training courses, participation on relevant international committees and meetings on public communication, emergency planning/response and emergency monitoring, and organisation of internal/national training delivered by the EPA, national and international experts.

The EPA (and formerly the RPII) has collaborated over many years with the IAEA, across a range of areas of mutual interest including radiation safety, radon, environmental radioactivity and emergency preparedness and response. This has been achieved through the provision of experts for IRRS and EPREV review missions and technical support missions, for consultancy meetings to prepare new standards and of lecturers and officers for meetings run by the IAEA. These activities have been undertaken by a number of EPA staff and the experience has proven extremely beneficial in terms of staff development and competence building.

Openness and transparency of regulatory activities

One of the key strategic goals for the EPA is to provide information on radiation protection, in a readily accessible and understandable format, so that the public has the necessary information to protect themselves from the harmful effects of exposure to radiation. A range of communication activities are undertaken each year to meet this objective and to promote the work of the EPA through the media, events, advertising, the EPA website, free phone call centre for radon advice, presentations and publications.

The media play a significant role in disseminating information and in reporting on radiological protection issues of public concern. Press releases are issued to coincide with the EPA's major events and media interest in EPA activities is strong with staff participating in many television and radio programmes on an annual basis. The print media also have a keen interest in EPA activities. Feature articles have also been placed in publications which assist in highlighting the array of activities that the EPA is responsible for. The EPA ensures that all public communications are focused and use the media to target various groups in the community and continuously develops their existing relationships with the media.

Each year the EPA hosts a number of events including report launches, seminars and presentations with the objective of disseminating information to targeted groups.

The EPA's website, www.epa.ie, is a valuable source of key information and provides details of the radiation protection work performed by the EPA, including publications and data (monitoring reports, assessments, online gamma dose rate measurements, etc.).

More recently, the EPA have been training staff in the use of social media to communicate with the public to provide information, highlight activities and seek information in matters related to ionising radiation.

Each year, the EPA produce a number of publications, including reports, guidance notes, codes of practice, information leaflets and posters – all of which are available free of charge on www.epa.ie.

Communications activities include:

- Hosting of annual liaison workshop for Radiation Protection Advisers (Qualified Expert) to update them on new developments in regulatory and licensing procedures and to share regulatory information and seek feedback from them. These workshops are open to both existing and applicant RPAs;
- Regulatory staff routinely present reviews of inspection findings to scientific and stakeholder meetings;
- Dissemination of radiation protection information to the public on social media.

Article 8 (2) Status of the regulatory body

The Environmental Protection Agency is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992 reporting to the Department of Environment, Climate and Communications. The responsibilities of the EPA were extended in August 2014 following its merger with the Radiological Protection Institute of Ireland (RPII) under the Radiological Protection (Miscellaneous Provisions) Act 2014. Appropriate coordination between the Department and the EPA is underpinned through a Performace Delivery Agreement which is regularly reviewed and updated.

The publication of an Annual Report and Accounts is the primary means by which the EPA reports on its activities. The EPA Act requires that the EPA present to the Minister a report on its activities during the year and that copies of the report will be laid before the Houses of the Oireachtas (Irish Parliment) as soon as possible after the end of the financial year, but not later than six months thereafter.

There are also other lines of communication with Governmental authorities including appearing before the Joint Parliamentary Committee on the Environment each year where the EPA has to account for, and respond to questions on, its annual programmes of work. These proceedings are broadcast. For specific programmes, staff of the EPA participate on Inter-Departmental working groups and taskforces that are chaired by Government Ministers or Senior Officials e.g. the High-Level Group on Radioactive Waste and the Government Taskforce on Emergency Planning.

Under the Radiological Protection Act of 1991, the EPA regulates practices using ionising radiation through a graded authorisation system of licensing and registration, the terms and conditions of which are set out under S.I. No. 30 of 2019, which is a Ministerial Order made under Section 30 of the 1991 Act. All decisions on applications for radiological authorisations are taken in accordance with the delegation of authorities approved annually by the EPA Board. There is no requirement to consult with any external bodies. Where applications are received for new

technologies or a previously unauthorised practice, which is new or novel, the EPA may set up an authorisation review panel comprising of staff from the Radiation Protection Regulation Unit, to review the application and make a recommendation on whether an authorisation can be issued. This ensures that authorisation decisions are not made on the basis of just one individual's review of the application.

For inspection activities, the EPA ensures independence through accreditation as a Type A inspection body to the ISO 17020:2012 standard. As part of this standard, the EPA must be independent of those organisations being inspected and no inspection related activities can be influenced by any stakeholder. External expert consultants are on occasion brought in to assist in specialist inspections. However, since inspections are carried out under the ISO 17020 Quality Management System, consultants must comply with the requirements of the standard in terms of training, independence and impartiality. In all cases the responsibility for determination of conformity of the facility being inspected remains with the EPA inspector.

The EPA has developed enforcement procedures, which sets out the procedures for determining which enforcement actions are followed in various situations where serious non-compliances are identified during the course of inspections or other regulatory activities. By adhering to the procedures set out in this policy, the EPA ensures that all enforcement decisions taken by staff are objective in nature. While staff will make a recommendation as to whether a particular enforcement action is taken, the final decision is a matter reserved for the EPA Board.

The EPA has a number of measures in place to minimise possible occurrences of conflicts of interest. These include the following:

- All inspectors are required to adhere to an inspector's code of conduct;
- All staff are required to adhere to the EPA's Code of Conduct for Directors and Staff of the EPA which explicitly deals with potential conflicts of interest;
- Sections 37 and 38 of the EPA Act, 1992 explicitly requires Directors and Staff of the EPA to declare and disclose any interests that could be likely to influence them in relation to any matter coming before the Agency or in the exercise of any function of the Agency; and
- The EPA maintains a Risk Register which is used to manage risk in areas where there may be potential conflicts of interest.

Article 9 Responsibility of the licence holder

Stringent regulatory controls are in place to protect workers from exposure to harmful levels of ionising radiation. The Safety, Health and Welfare at Work Act, 2005, requires employers to identify hazards in the workplace, assess the risk to health and safety from these hazards, and put in place measures to eliminate or reduce the risk. The primary Irish legislation governing the protection of

workers and members of the public from ionising radiation is the Radiological Protection Act, 1991, and its supplementary legislation - particularly IRR 2019. These regulations explicitly make the licence holder responsible for all aspects of radiation protection relating to the sources of ionising radiation for which they are authorised. The EPA is responsible for implementing this legislation.

The licensing system in Ireland for sealed and unsealed sources had been in operation since 1977. This system was updated to a graded authorisation system. As part of the system, information has been gathered and maintained on all such sources. This database provides a useful tool in the "cradle to grave" management of sources.

Authorised holders of disused sources are required to verify their holdings at specific periods which are set out in their EPA authorisation and to report any anomalies to the EPA. Sealed sources, whether in use or not, must be leak tested not less than once every two years or as recommended by the manufacturers and reported to the EPA.

EPA authorised users are required, as a prerequisite to their authorisation being issued, to have an agreement with the source supplier or manufacturer to take back sources ("take back agreement") when they become disused. The EPA looks for written evidence from the supplier or manufacturer that the source will be accepted back when no longer required before issuing a licence.

Authorised users are required to consult with a Radiation Protection Adviser (RPA). Furthermore, the EPA maintains a Register of all persons approved to act as RPAs to undertakings in the medical, dental, educational and veterinary sectors.

EPA authorised users wishing to transfer sources between sites must comply with the International Atomic Energy Agency transport regulations, national regulations and any authorisation conditions that the EPA may consider important to impose. A specialised training course for those involved in the transport of relevant radioactive consignments was first approved by the EPA in 2007 and has been re-evaluated on an annual basis since then. Similar arrangements apply to transboundary shipments. Transboundary shipments of sources within the EU are governed by specific pieces of European Community legislation.

General requirements of the authorised user include a duty to keep records, to ensure proper labelling of sources and containers, to provide training and to arrange for the appointment of responsible persons. They are obliged to inform the EPA of any changes in the inventory of radioactive sources for which they are responsible and to have their authorisation amended accordingly.

In addition, undertakings must also take all measures necessary to ensure the best possible protection of members of the public and must provide to the EPA, when requested, documents setting out how these measures are ensured.

Currently there are no formal provisions for ensuring that undertakings maintain open and transparent communication with the public, but given the nature of the activities currently authorised throughout Ireland, this is not considered a problem and was not raised as an issue requiring action by the IRRS review team during its mission to Ireland in 2015.

Article 10 Priority to safety

In Ireland primary responsibility for the safety of an installation rests with the undertaking carrying out an authorised practice at the installation. Such an allocation of responsibility is derived primarily from legal principles developed by the courts in the area of tortuous liability (i.e. negligence, occupier's and employer's liability etc). The imposition of such primary responsibility on the party carrying out an activity has been reinforced through primary legislation such as the health and safety legislation and miscellaneous secondary legislation such as S.I. No. 30 of 2019.

In accordance with the requirements of Article 33 of the Ionising Radiation Regulations, all undertakings are required to seek advice from an approved Radiation Protection Adviser (RPA), within their area of competence. Licensee's are required to submit to the EPA the agreed arrangements with the named RPA detailing the provisions that are in place to meet the requirements of the Regulations. Undertakings applying for a registration must complete a self-declaration form confirming that they will consult with an RPA.

The RPA has a number of statutory functions including advising the undertaking on:

- the examination and testing of protective devices and measuring instruments;
- the prior critical examination of plans for installations from the point of view of radiation protection;
- the acceptance into service of new or modified sources from the point of view of radiation protection;
- the regular checking of the effectiveness of protective devices and techniques;
- the regular calibration of measuring instruments and the regular checking that they are serviceable and correctly used;
- the categorisation of controlled and supervised work areas;
- The classification of workers;

- appropriate quality assurance programmes including quality control measures to be taken; for irradiating apparatus, nuclear devices and radioactive substances;
- the estimation of doses for workers; and
- the preparation of appropriate documentation such as prior risk assessments and written radiation safety procedures.

The Ionising Radiation Regulations contains strengthened requirements in relation to Radiation Protection Education, Training and Information. Article 35 of the Regulations requires the undertaking to ensure that exposed workers, apprentices and students including outside workers are given appropriate education, training and information in the field of radiation protection and receive such information and instruction as is suitable and sufficient for them to know:

- the risks to health created by exposure to ionising radiation
- the general principles of radiation protection
- radiation protection procedures and precautions specific to their own working conditions
- the importance of providing input to Risk Assessments for the purposes of devising relevant radiation protection procedures
- the relevant parts of the emergency response plans and procedures
- the importance of complying with the medical, technical and administrative requirements.

In addition, adequate information must be given to ancillary staff to ensure their health and safety. There is additional training requirements for undertakings with high-activity sealed sources. In practice the training is provided either by external course providers, the appointed RPA or the Radiation Protection Officer (employee of the licensee).

Article 11 Financial and human resources

Article 11 (1) Financial resources

EPA authorisation conditions specify that adequate provision must be made, by way of a financial security or any other equivalent means appropriate to high activity sealed sources (HASS), for the safe management of HASS when they become disused sources. A documented financial costing for the safe management of HASS is required with all licence applications/amendments for HASS. This costing shall be signed by the General Manager or equivalent of the company concerned. In addition, a written guarantee from the General Manager or equivalent of the company concerned to cover the cost of management/disposal is required to accompany all licence applications and all applications for amendments. This guarantee covers the return or disposal of HASS, including all packaging, transport and return fees even in the event of the applicant/licensee becoming insolvent or going out of business. Any changes in the financial arrangements have to be confirmed in writing to the EPA on an annual basis.

Article 12 Human Factors

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 13 Quality Assurance

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 14 Assessment and Verification of Safety

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 15 Radiation protection

Ionising radiation in the workplace is regulated by the IRR 2019. The regulations apply to all practices which involve a risk of exposure to ionising radiation. Under these regulations the EPA has responsibility for licensing and regulating sources of ionising radiation. The Order deals with licensing requirements including:

- Workplace arrangements
- Workplace classification
- Controlled and supervised areas
- Radiation safety procedures
- Classification of exposed workers
- Appointment of Radiation Protection Advisers
- Information and training
- Monitoring of the working environment
- Dose monitoring of personnel
- Approval of dosimetry and radiation measurement services
- Special medical surveillance of exposed workers
- Protection of apprentices, students and outside workers
- Protection of the public
- Control of radioactive substances, nuclear devices and irradiating apparatus.

Any undertaking wishing to commence a practice involving a source of ionising radiation must apply to the EPA for an authorisation prior to commencing the activity. The application must include details of the applicant, the types and sizes of sources and the nature of the activities to which the application refers and be supported by a risk assessment and a set of radiation safety procedures. For practices which have not been previously authorised the application must be supported by a justification. Where an application is successful, the EPA will issue an authorisation in the form of a licence or a Certificate of Registration. Licences are valid for ten years while Certificates of Registration are indefinite. In addition, the EPA attach conditions to each authorisation which the undertaking must comply with. Failure to comply with a condition of an authorisation is a prosecutable offence.

Dose limits for occupational exposure are set out in Regulation 23 of IRR 2019. The limit on effective dose for an exposed worker is 20 mSv in a period of 12 months. The limits on equivalent dose for an exposed worker in a period of 12 months are as follows:

- Lens of the eye - 20 mSv in a single year or 100 mSv in any 5 consecutive years subject to a maximum dose of 50 mSv in a single year;
- Skin - 500 mSv (averaged over any area of 1 cm^2);
- Hands, forearms, feet and ankles - 500 mSv.

Discharge Authorisation

The practice of liquid radioactive waste disposal relates mainly to the medical sector in Ireland. It is a condition of EPA licences granted in the medical sector, where unsealed sources are used, that there is annual reporting of the quantities discharged. This data is collated annually by the EPA and is available to the OSPAR Commission as part of Ireland's reporting requirements under the OSPAR Convention.

Environmental Monitoring

The EPA continues to monitor radiation in the environment with the aim of assessing the exposure of the population. The most recent annual monitoring programmes showed that liquid discharges from the Sellafield nuclear facility remains the dominant source of human-made radioactivity in the Irish Sea and that the consumption of locally sourced seafood continues to be the main way in which the public is exposed to this radiation source. The radiation doses to typical consumers of seafood were below 1 microsievert (µSv), and this represents only a small fraction of the average annual dose (4,037 µSv) to a person in Ireland from all sources of radioactivity.

Levels of ambient gamma dose rate are continuously measured at 15 stations and levels of radioactivity in air are measured at 11 stations around the country. Overall levels of human-made radioactivity in the Irish environment during 2021 were broadly in line with levels reported in recent years. The levels of radioactivity in milk, drinking water and mixed diet were also low and consistent with levels measured in previous years, and provide confirmation that the levels of human-made radioactivity in the environment do not constitute a risk to health and are very small when compared with the dose received as a result of natural background radiation.

Article 16 Emergency preparedness

Article 16 (3) Emergency preparedness for Contracting Parties without nuclear installations

Ireland's Emergency preparedness is divided into three main areas, i.e.,

- Site emergency planning. These plans relate to licensees' responsibilities in the keeping of sources or of disused sources or their transport.

- Local/regional emergency planning. These plans relate to the response to major emergencies at the local and regional level by the emergency services (Police, Fire Service, Ambulance, and Coast Guard) and their associated agencies.
- National emergency planning - designed to cater for a widely dispersed radiological emergency or crisis such as that arising from a major incident at a nuclear installation abroad resulting in radioactive contamination reaching Ireland. Certain elements of the national emergency response would also come into play in the case of a local emergency depending on the extent of the emergency.

The Framework for Major Emergency Management makes provision for linking the local and regional level co-ordination arrangements of the principal response agencies with the national arrangements under the National Plan.

Site emergency planning

Undertakings licensed to carry on certain defined categories of practice, such as transportation of radioactive materials, industrial radiography, industrial irradiation, nuclear medicine and radiotherapy are required, under the IRR 2019, to evaluate the possibility of a radiological emergency resulting from the practice and, based on the evaluation, prepare detailed emergency plans in consultation with a radiation protection advisor, the EPA and the local authority within whose local government area the practice is being undertaken. These plans must be based on risk assessment and must address potential risks to workers, intervention personnel (e.g. fire services) and where appropriate members of the public. IRR 2019 also require that undertakings immediately notify the EPA of an emergency and to inform the local emergency services of the circumstances with respect to the emergency. A multi-agency protocol has been prepared by the - National Directorate for Fire & Emergency Management in collaboration with the EPA to assist inter-agency emergency response by fire, ambulance and police services to local radiological incidents. It should be noted that Ireland does not have any facilities in Emergency Preparedness Categories I or II as defined in IAEA Safety Requirements GSR Part 7.

Registrants and Licensees are obliged to report incidents within 24 hours to the EPA. Where it is concluded that the incident was the result of failure of equipment or shortcomings in procedures, other undertakings who use the same equipment or who are involved in the same or similar procedures and where by implication, the same incident could occur, are advised accordingly. Incidents, which arise from negligence on the part of the registrant or licensee, may result in prosecution.

Major Emergency Plans

In Ireland, Major Emergency Plans are in place in all local authority areas and may be activated by any one of the Principal Response Agencies: the Local Authorities, An Garda Síochána (Police), the Health Service Executive and the Coast Guard. Major emergencies include those resulting from fires, transport accidents, hazardous substances incidents and severe weather. The Major Emergency Plan of each agency sets out that agency's response, as well as its contribution to the combined response of all agencies. In September 2006, the current Framework for Major Emergency Management was launched by Government and following from this all Major Emergency Plans were updated. This Framework is currently being revised.

As part of the Major Emergency Development Programme, a series of inter-agency protocols to underpin the multi-agency response to different categories of emergency was developed, including a Protocol for Multi-Agency Response to Radiological/Nuclear Emergencies. This protocol was prepared under the aegis of the National Steering Group on Major Emergencies, with the assistance and co-operation of the National Directorate for Fire & Emergency Management and the EPA. A review and update of this protocol is currently being led by the Department of Environment, Climate and Communications (DECC), as part of the overall revision of the Major Emergency Management Framework.

The aim of the protocol is to enable the Principal Response Agencies and their Principal Emergency Services to work together and to respond effectively and safely and to assist them in working, if necessary, with the EPA and others to successfully manage emergencies that may have a radiological/nuclear dimension. The protocol outlines the arrangements for emergencies such as spills, fires and transport accidents. The protocol was drafted based on information from international sources, including the International Atomic Energy Agency (IAEA), World Health Organization (WHO), and the International Commission on Radiological Protection (ICRP). In particular, it uses the advice given in the IAEA's "Manual for First Responders to a Radiological Emergency".

National Level Emergencies

In July 2017, the Office of Emergency Planning in Ireland published a Strategic Emergency Management (SEM) National Structures and Framework[4] document and associated Annexes. The SEM identifies 50 different emergency/incident types that would require a national level response. It provides the basis for the National-level strategic emergency management and the supports required should such emergencies. It outlines the structures for co-ordinating a "whole of

[4] https://www.gov.ie/en/publication/7ff6f-strategic-emergency-management-sem-national-structures-and-framework/#

government" approach and the framework for achieving a systems approach to emergency management. This framework is complemented by a series of SEM guidelines dealing with specific aspects of strategic emergency management such as Emergency Communications, Critical Infrastructure Resilience and Climate Change Adaptation.

The SEM has identified 50 scenarios that would require a national level, whole of government response and includes nuclear accidents/incidents/events abroad, local radioactive contamination and malign Chemical-Biological-Radiological-Nuclear (CBRN) incidents.

In the event of a nuclear cccident/incident/event abroad, the Lead Government Department responsible for planning for and responding to such an emergency is the Department of Environment, Climate and Communications (DECC) with approximately 20 other Government Departments and State Agencies having a principal support role in assisting DECC. Preparedness and response to a nuclear accident is described in the National Plan for Nuclear and Radiological Emergency Exposures.

A national protocol for responding to CBRN incidents (malign Chemical-Biological-Radiological-Nuclear incidents) was completed by the Government Task Force (GTF) on Emergency Planning in 2011. The protocol covers acute incidents where the location of the potential contamination is known and contained.

National Plan for Nuclear and Radiological Emergency Exposures ("The National Plan")

The emergency preparedness and response provisions outlined in the European BSS Directive were transposed into Irish law through IRR 2019. A new National Plan for Nuclear and Radiological Emergency Exposures ("The National Plan") has been developed by DECC to implement these provisions. The National Plan replaces the National Emergency Plan for Nuclear Accidents which was published in 2005.

The National Plan sets out details of Ireland's planning and preparedness for a national response to a nuclear or radiological emergency likely to cause widespread exposure across Ireland. The National Plan was reviewed by the Government Task Force on Emergency Planning and has received ministerial approval.

The National Plan sets out a framework for a coordinated national response to an event where the response is beyond the resources or capabilities of any individual Government Department or public authority and as such requires the political and strategic involvement of Government. The main elements of the National Plan cover:

- Hazard Analysis;
- Mitigation;
- Planning and Preparedness;
- Response; and
- Recovery.

Incidents occurring in Ireland and affecting only a limited area, nuclear hostilities and malign CBRN incidents do not fall under the scope of the National Plan, but if required some or all of the arrangements provided in the National Plan may be invoked as part of the emergency response. Such incidents include accidents involving nuclear powered ships or ships transporting radioactive substances in waters close to the Irish coast (response co-ordinated by the Irish Coast Guard) and local dispersal of radioactive substances that may require a further scaling up of response. These incidents may require further co-ordination with the EPA up to and including activation of the National Plan by DECC, if necessary.

The national response to a widespread radiation emergency or crisis is likely to involve mobilisation of the resources and expertise from a broad range of public authorities/agencies within the State. The National Plan envisages that in the event of a major radiological emergency, a National Emergency Coordination Group (NECG) would be convened to coordinate the response. The NECG for nuclear accidents is made up of officials from key Government Departments and other public authorities and is chaired by the Department of Environment, Climate and Communications. This NECG is responsible, inter alia, for making decisions on protective actions and for co-ordinating their implementation. In an emergency, the NECG would meet in the National Emergency Coordination Centre (NECC) which has been equipped to coordinate the national response to emergencies.

The EPA has an emergency preparedness and response plan referred to as the 'EPA Nuclear and Radiological Plan', which describes the arrangements in place to fulfil its responsibilities with regards to emergency preparedness and emergency response under the National Plan, the EPA nuclear and radiation emergency response structure and the roles of teams and individual staff members in responding to a radiation emergency. In 2017 a strategic review of the EPA's emergency response/emergency arrangements was conducted by external consultants (Operational Command Training Organisation Ltd.) and this review concluded that the EPA's arrangements for a nuclear or radiological emergency were robust.

The EPA Nuclear and Radiological Plan is a living document and it is based on the principle of continuous improvement. The latest version was issued in 2022 and training on the plan was

delivered to all staff with response roles. The responsibility for overseeing the preparation of internal EPA plans for the various aspects of response lies with the EPA's Emergency Preparedness unit. The Emergency Preparedness unit is supported by an Emergency Preparedness Cross Office Team which meets approximately 4 times per year and includes representatives from all EPA offices.

One of the strategic actions for the EPA in the period 2016 to 2020 was to extend the EPA Nuclear and Radiological Plan to include all relevant EPA capabilities. This includes:

- Training staff in the regional chemistry laboratories on sample preparation and sample screening;
- Making use of the regional presence of EPA in local radiological incidents by training staff to use radiation monitoring equipment;
- Identifying staff involved in atmospheric dispersion modelling to participate in the Technical Assessment Team and assist with modelling the spread of radioactive material from an accident site;
- Making use of staff with experience of mapping and GIS to participate in the Technical Assessment Team to assist with displaying emergency monitoring data in graphical format to decision makers;
- Including staff who can provide advice on dealing with conventional waste (in particular food waste) in the emergency response plan;
- Training all reception staff to process messages received from the international notifications used by the EC and the International Atomic Energy Agency;
- Increasing EPA's capacity to analyse samples in an emergency by purchasing sodium iodide detectors for screening samples in the regional water chemistry laboratories in an emergency.

Notification of a nuclear incident

Early formal notification of a nuclear accident abroad would be received in Ireland through either or both of the following:

- The European Community Urgent Radiological Information Exchange (ECURIE) arrangements, which have been set up within the European Union to implement Council Decision 87/600/Euratom providing for the early exchange of information in the event of a radiological emergency.
- The IAEA EMERCON arrangements, which are based on the 1986 Early Notification Convention.

The Contact Point for both ECURIE and EMERCON in Ireland is the national police service, An Garda Síochána. The EPA is the national competent authority for both sets of arrangements. The EPA operates an on-call duty officer system, whereby a senior member of EPA staff is available 24 hours a day, 7 days a week to assess any alert and where necessary to activate the emergency response. On receipt of an alert notification, the Contact Point will immediately contact the EPA duty officer who will make an initial assessment of the situation. Based on this assessment, DECC will decide if the NECG should be convened. In the event that the decision is taken to convene the NECG, arrangements are in place for the Office of Emergency Planning to rapidly notify the appropriate key staff in the relevant Government Departments and public authorities.

In the event of an incident occurring at nuclear installations in the UK, arrangements have operated since 1992 whereby the UK Department of Business, Energy and Industrial Strategy (BEIS) informs Ireland's DECC and the EPA when it is notified of an incident on UK territory involving a release of radioactivity into the environment. This is regardless of whether the incident has any radiological significance for Ireland. On 10th December 2004, Ireland and the Government of the United Kingdom and Northern Ireland signed a Bilateral Agreement on Notification in the Case of a Nuclear Accident or Radiological Emergency. This Agreement was designed to formalise the above-mentioned existing arrangements by ensuring that exchanges of information happen on an agreed basis through specified channels. In 2019, operational arrangements to support this Bilateral Agreement were agreed by all parties.

The Bilateral Agreement on Notification in the Case of a Nuclear Accident or Radiological Emergency states that in the event of an incident from which a release of radioactive material occurs, or is likely to occur, and which has resulted or may result in a release that could have an effect or the risk of an effect outside a Party's territory and be of radiological safety significance to the territory of the other Party, the information that will be provided in the event of an incident includes:

- the time, exact location where appropriate, and the nature of the accident or incident;
- the facility or activity involved;
- the assumed or established cause and the foreseeable development of the accident or incident relevant to the transboundary release of the radioactive materials;
- the general characteristics of the radioactive release, including, as far as practicable and appropriate, the nature, probable physical and chemical form and the quantity, composition and effective height of the radioactive release;
- information on current and forecast meteorological and hydrological conditions, necessary for forecasting the transboundary release of the radioactive materials;

- the results of environmental monitoring relevant to the transboundary release of the radioactive materials;
- the off-site protective measures taken or planned, including measures taken or planned to inform the public; and
- the predicted behaviour over time of the radioactive release.

There is a bilateral agreement covering information exchange between the EPA and the UK's Office for Nuclear Regulation. This agreement covers both routine bilateral meetings between the two regulatory agencies and arrangements for rapid exchange of information in the event of an incident or accident. This Information Exchange Agreement was renewed in 2021.

In May 2018, Ireland joined the International Atomic Energy Agency's Response and Assistance Network (RANET). EPA's expertise in atmospheric dispersion modelling, radiation dose assessment and environmental sampling and the analysis of radioactivity in samples was added to RANET. The EPA tested their RANET capabilities by participating as an assisting State in the IAEA's Conv-Ex 2b exercises in each year since 2018.

Arrangements for the early detection of atmospheric contamination

As part of Ireland's environmental radioactivity monitoring programme and emergency preparedness, the EPA operates a National Radiation Monitoring Network (NMRN) for the detection and measurement of radioactivity in the air and deposits on the ground, through the measurements of external gamma dose rate, air monitoring and analysis of precipitation samples (See Figure 3).

The NRMN consist of twenty-two sites across Ireland that constantly monitor radiation levels in the environment, with the support of the national meteorological service (Met Éireann), local authorities and the Defence Forces. The locations of the twenty-two sites are illustrated in Figure 3. Fifteen of the twenty-two sites host a continuous gamma dose rate monitor that automatically communicate hourly dose rate measurements. These hourly dose rate measurements are transmitted live to the EURDEP (EC) database, from there to the worldwide IRMIS system (IAEA), and published on the EPA website. Ireland and the UK also share the data from their national gamma dose rate monitoring stations, with data automatically exchanged on an hourly basis. In addition, the gamma dose rate data from the Irish national monitoring network are published on the EPA's website for public access (http://www.epa.ie/radiation/monassess/mapmon/).

Eight of the twenty-two sites contain precipitation samplers, which are changed monthly: in routine monitoring two samples are measured each month in the EPA's National Radiation Monitoring

Laboratory (NRML) in Dublin. Five sites contain 4 m^3/hr 'low volume' aerosol filter-roll units that automatically communicate alpha/beta radioactivity readings to the EPA. Seven sites contain six m^3/hr 'low volume' aerosol samplers that are changed on a weekly basis: all filters are sent back to the NRML and one sample per month from each site is measured by gamma-ray spectrometry and for gross beta using a gas proportional counter. Two sites contain a 900 m^3/hr 'high volume' aerosol sampler that is changed weekly and filters are measured by gamma-ray spectrometry at the NRML. All aerosol samplers contain charcoal cartridges to sample for radioiodine in case of a nuclear or radiological incident.

The National Radiation Monitoring Network is being renewed through a €3.3M project. An upgrade of the NRMN was initiated in 2019 and is focused on several improvements including:

- The moderate expansion in the number of NRMN sites brings site density up to median EU levels;
- Equipping all sites for dose rate, aerosol, and precipitation monitoring;
- Significant modernisation of radiometric equipment;
- Modern and more resilient telemetry systems, offering robust data pathways required by the NRMN for secure emergency response and resilience.

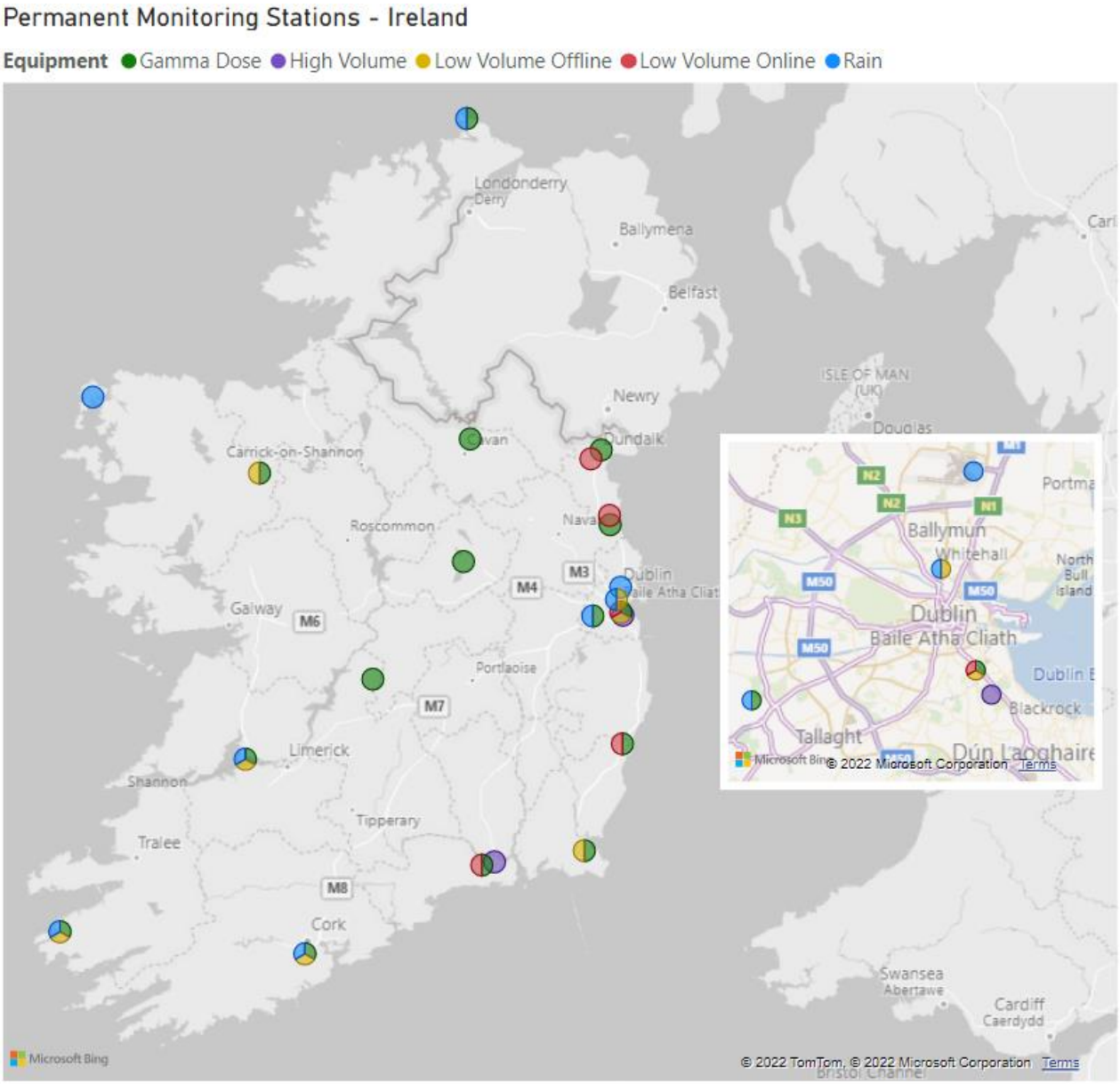

Figure 3. Map of permanent monitoring stations operated by the EPA

Hazard Assessments

One of the principal elements of the systems approach to emergency management is a hazard assessment. Ireland has completed a number of key assessments which considered the risks to Ireland from nuclear accidents at the Sellafield Nuclear Facility, at one of the proposed nuclear power plants in the UK and from radiological emergencies arising from sources in use in Ireland.

The EPA completed a detailed assessment of the radiological impacts on Ireland of four severe hypothetical accident scenarios at the Sellafield nuclear facility in England. The hypothetical accidents were those identified in a risk assessment of Sellafield commissioned by the Irish Government as having the greatest potential to have an impact on Ireland. The study assessed the potential exposure to radiation for people and contamination of the environment for a year following an accident. For each of the worst case scenarios considered, the predicted radiation doses were found to be below the levels which would require measures such as sheltering, relocation or evacuation of people. However, without appropriate food controls, significant radiation doses could be incurred in the year following the accident through the consumption of contaminated foods.

In addition, the Irish Government commissioned the Economic and Social Research Institute (ESRI) to carry out a study to assess the Potential Economic Impact on Ireland of a Nuclear Incident in North-western Europe. This study considered four scenarios to develop indicative estimates of the scale of economic losses that might arise. These scenarios were designed to provide a spectrum of outcomes across different seasons and included a scenario where there is no actual radiological impact on Ireland; one where there is some low-level contamination of the environment and food in Ireland; one where the degree of contamination of the environment and food in Ireland warrants food controls and agriculture protective actions for a number of months; and finally one encompassing significant contamination of the environment and food in Ireland such that people are advised to remain indoors as much as possible for up to 48 hours. The report provides lower bound estimates of the potential economic impacts on Ireland in each of the scenarios examined.

Arrangements for assessing the potential impact of a nuclear accident/incident

Since 2001, the EPA has employed the ARGOS (Accident Report and Guiding Operational System) decision support tool as its primary platform for performing atmospheric dispersion modelling, dose projections and impact on the food chain in a nuclear emergency covering a range of 300km from the nuclear accident site. ARGOS was originally developed by the Danish Emergency Management Agency (DEMA) in association with the Danish software company Prolog Development Centre (PDC). Ongoing development and maintenance of the system is currently managed by an international consortium consisting of representative agencies from Australia, Brazil, Estonia, Ireland, Lithuania, Norway, Sweden and PDC. The EPA is Ireland's representative

on the ARGOS Consortium. The ARGOS system allows prognostic, measurement and meteorological data to be viewed and overlaid in a geographic information system. The system is updated regularly to incorporate any lessons learnt from exercises or emergencies. The EPA also uses the RODOS Decision Support System for Off-Site Emergency Management. This is a very similar system to ARGOS, since it uses the same atmospheric/food dose models and is maintained by the Karlsruhe Institute of Technology in Germany. A third atmospheric dispersion model called HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory), is used by the EPA. This model, developed and maintained by the US National Oceanic Atmospheric Administration (NOAA), does not include the capability to calculate radiation doses, but it does allow long-range dispersion modelling (on a global scale) of radionuclides in air. The three applications provide resilience to the EPA in that more than one atmospheric dispersion model is available in an emergency.

For the assessments of events in the vicinity of Ireland, all systems (ARGOS/RODOS/HYSPLIT) use high resolution meteorological data (2.5 km horizontal grid) produced by Met Éireann using its operational numerical weather forecast model HARMONIE. The latest forecasts provide information on the weather conditions up to 54 hours ahead while the EPA maintains an archive of meteorological data for the previous 50 days to provide information on the past evolution of a radioactive plume. For ARGOS and RODOS, the EPA can use weather forecast data (50km horizontal resolution) provided by NOAA to track the movement of radioactive material in the atmosphere over the global scale while for HYSPLIT, the EPA can use weather forecast data (9km horizontal resolution) provided by the European Centre for Medium-Range Weather Forecasts.

The EPA has an information management system called the EPA Emergency Response Portal which was developed in SharePoint Online to support its emergency preparedness and response arrangements. The Emergency Response Portal includes emergency contact details for use in an emergency and it also supports the processing, recording and disseminating incoming information during an emergencyr. It can be used to display dispersion model outputs and monitoring data and it contains details of international emergency notification systems and other useful background information as well as emergency procedures.

Public information

Arrangements are in place to inform the public of the accident, its consequences and of any countermeasures that are to be implemented to reduce doses to the population. This information would be issued through media channels: radio, television including social media, internet, press statements, press conferences and via national weather forecast broadcasts on television and radio. Regular updates of the situation would be given. In Ireland, Regulation 59 of IRR 2019 outlines the steps that need to be taken in the event of an emergency where members of the public could be exposed. This includes basic facts on radioactivity and its effects on human beings and

the environment, types of radiation exposure and its consequences for the public and the environment and the measures used to alert, protect and assist the public in the event of an exposure.

Public opinion is an important part of emergency preparedness and comments received from the public are taken into consideration as part of the planning process. Emergency planning developments are published in the Annual Reports of the EPA and other statutory agencies such as local authorities update their emergency planning procedures including for nuclear emergencies on a regular basis. These are also published.

The EPA has a dedicated emergency preparedness section on its website (https://www.epa.ie/environment-and-you/radiation/emergencies/). These pages provide background information on emergency planning in Ireland for the public and licensees. In addition, the EPA use the @EPAIreland twitter account as a method of communicating quickly and easily with the general public. This may be used to keep the public informed during an emergency response.

Exercises of the emergency arrangements

Communication systems and arrangements for exchange of early notifications are tested regularly. A programme of testing of the ECURIE arrangements is coordinated by the European Commission. This includes tests of the duty officer contact arrangements and the exchange of simulated radiological data between Member States. Equivalent arrangements are in place to test the EMERCON notification system (USIE) coordinated by the IAEA. It is recognised that international cooperation on exercises is essential. Irish authorities regularly participate in international exercises such as those in the INEX series and the ConvEx exercises coordinated by the IAEA. The EPA also participates in the ECURIE Level 3 exercises coordinated by the European Commission.

The next national nuclear exercise is scheduled to take place in September 2022 with the main aim of the exercise being to exercise the structures and arrangements outlined in the National Plan in order to confirm aspects of implementation and to identify any gaps in the plan or in the arrangements in place within participating organisations. The objectives for the exercise include:

- To provide an opportunity for the National Emergency Coordination Group (NECG) to practice implementing the structures and arrangements in place for coordination of the national response to a nuclear or radiological emergency, and to confirm aspects of said arrangements at governmental, departmental and agency level;
- To practice the NECG decision-making process in conditions of uncertainty, where information is limited, and time is of the essence;

- To identify and discuss the protective actions required to reduce radiation exposure of the public during a nuclear emergency impacting on Ireland;
- To provide an opportunity for the NECG and its Communications sub-group to practise identifying key messages required to inform, reassure and advise the public during a nuclear emergency, and how these will be communicated to the public;
- Practise NECG communications and media management during the response to a nuclear or radiological emergency, including any requirements under bilateral arrangements or international agreements;
- To examine measures that can be implemented in order to reduce panic amongst the public, including panic buying, mass travel, and to examine whether and how such measures could be enforced if necessary;
- To confirm arrangements in place across Departments and agencies for sampling during a nuclear or radiological emergency; and
- To confirm the consular arrangements in place for supporting and advising Irish citizens in the state where the nuclear or radiological emergency occurs.

The main international exercises (routine notification exercises are not included) in which the EPA participated since 2020 are listed in Table 3. The EPA continued to participate in exercises remotely during the COVID-19 pandemic.

Table 2. Main nuclear international exercises EPA has participated in since 2020.

Year	Exercise (main focus)	National/International Exercise
2020	ConvEx-2a (use of USIE – notification of incident and reporting results)	International (IAEA)
	ConvEx-2b (requesting assistance following nuclear accident)	International (IAEA)
	ECUREX	International (European Commission)
	UK-Ireland Bi-lateral Agreement (test contact points outlined in the UK-Ireland Bi-lateral Agreement)	International (UK Department Business, Energy and Industrial Strategy)
2021	ConvEx-2a (use of USIE – notification of incident and reporting results)	International (IAEA)
	ConvEx-2b (To test the arrangements for a request and the provision of assistance. Ireland played as an assisting state.)	International (IAEA)
	ConvEx-3/ECUREX (Test of the full operation of the international emergency preparedness and response framework)	International (IAEA/EC)
	UK-Ireland Bi-lateral Agreement (test contact points outlined in the UK-Ireland Bi-lateral Agreement)	International (UK Department Business Energy and Industrial Strategy)

The EPA adopts an all-hazards approach to emergency preparedness and response. All emergency response plans are in line with EPA's Emergency Response Framework which was approved by the EPA Board in 2020. In addition to nuclear and radiological emergency exercises, the EPA also participates in exercises to test arrangements for responding to environmental emergencies. In October 2021, the first EPA-wide exercise took place which involved multiple teams from different offices across the EPA responding to several concurrent incidents (including radiological). The purpose of this exercise was to test the arrangements for notification, coordination and communication in the early phase of an emergency as described in the EPA's Emergency Response Framework and emergency-specific plans. Following the exercise, an action plan with 24 actions to enhance emergency preparedness and response arrangements was agreed by teams involved in responding during the exercise and implementation of these actions will be kept under review by the Emergency Preparedness unit with support from the Emergency Preparedness Cross Office Team.

Individual public authorities and agencies which have been assigned responsibilities under the National Plan are required to routinely test their emergency arrangements. The EPA, for example, routinely tests its arrangements including: communications arrangements, duty officer arrangements, emergency laboratory procedures and technical assessment procedures. The Defence Forces and Civil Defence regularly test their arrangements for monitoring and sample collection.

Ireland's Food and Feed Stakeholder Engagement Panel

Ireland's food and feed stakeholder engagement panel includes representatives from the food and feed sector, the food retail sector, government decision makers/experts and the Consumer Association of Ireland (Table 5). Since the most significant route of potential exposure for members of the Irish public in the aftermath of a nuclear accident abroad is the consumption of food containing increased levels of radioactivity, Ireland's national food and feed stakeholder engagement panel is a very important forum for the discussion of issues to do with radioactive contamination in food in the aftermath of a nuclear emergency.

Table 5. Organisations participating in Ireland's stakeholder panel

Government Departments	• Department of Agriculture, Food & the Marine • Department of Environment, Climate and Communications • Department of Housing, Local Government and Heritage • Office of Emergency Planning • Department of An Taoiseach - Government Information Service
State Agencies	• Environmental Protection Agency • Food Safety Authority of Ireland • A Bord Bia (Irish Food Board)
Dairy Sector	• Dairy Industry Ireland • Ornua (Dairy Co-operative)
Farming Sector	• Irish Farmers Association
Meat Sector	• Meat Industry Ireland
Crops Sector	• Teagasc (Agriculture and Food Development Authority) • Irish Grain and Feed Association
Seafood Sector	• Sea Fisheries Protection Authority
Retail Sector	• Musgraves Group • Tesco Ireland • Lidl Ireland
Consumer Sector	• Consumer Association of Ireland

The stakeholder panel was convened by EPA in November 2017 and again in October 2018 to discuss the feasibility of various protective actions that could be introduced in Ireland to prevent or reduce contamination of food intended for consumption and sale following a nuclear accident abroad, the uncertainties associated with decision making in such a scenario and communications to the public, industry and export markets. There were a number of key outcomes from these meetings particularly with regard to communications including the role of social media and the importance of ensuring that key messages are clear, timely and targeted for specific audiences such as farmers, retailers and vulnerable groups.

This panel was not convened during the COVID-19 pandemic.

Article 17 Siting

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 18 Design and Construction

Ireland has no nuclear installations and therefore nothing to report under this Article.

Article 19 Operation

Ireland has no nuclear installations and therefore nothing to report under this Article.