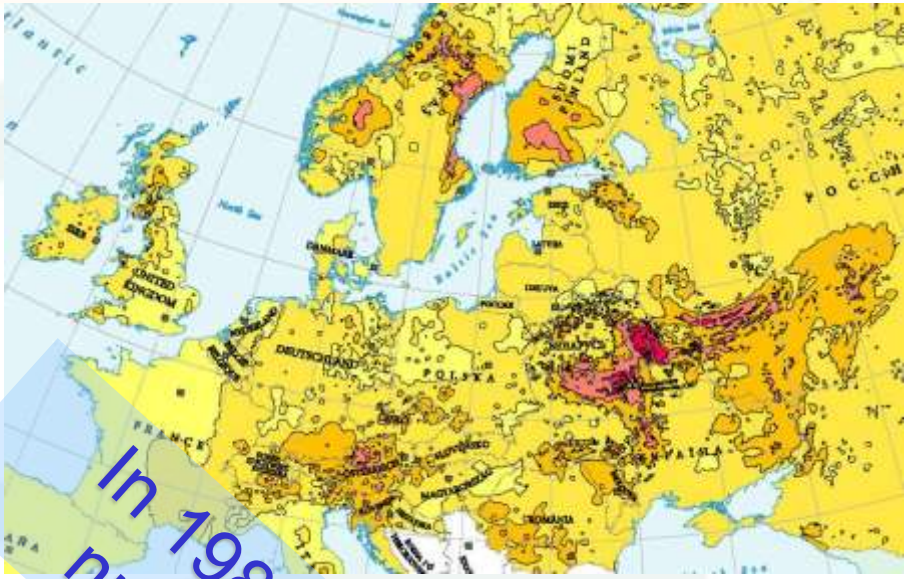
Irish Approach to Post-Accident Preparedness

Ciara McMahon, Veronica Smith, Robert Ryan (EPA)
Keith Leonard (National Directorate for Fire and Emergency Management)

12 October 2017

Ireland



In 1986 concluded: Need a nuclear emergency plan!

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Systems Approach to Planning

Used at National, Regional and Local Level involving a continuous cycle of activity.

The principal elements of the approach are:

- **Hazard Analysis *(includes Risk Assessment - 5x5 Matrix)***
- **Mitigation *(includes Risk Management)***
- **Planning and Preparedness**
- **Co-ordinated Response and**
- **Recovery (incl. Review and Feedback)**

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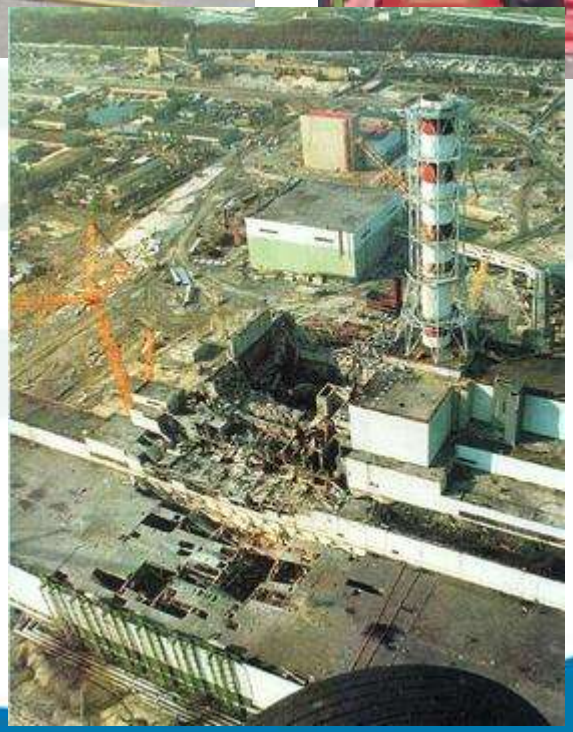
Step 1: Hazard identification and risk assessment

- Nuclear accident abroad
- Nuclear-powered vessel
- Incident involving licensed radiation source in Ireland
- Transport accident involving radioactive source in Ireland
- Lost/Found radioactive source
- Satellite re-entry
- …



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Key Hazard Assessments

Inside This Summary

The UK's Sellafield nuclear site, located on the Cumbrian coast, is at its closest point about 180 km from Ireland's coastline. Because of the site's location, its history, and the amount and type of radioactive materials there, the Government of Ireland and the Irish people have long been concerned about how an incident at the site might impact Ireland and the Irish Sea. [illegible] commissioned an assessment by experts to determine the [illegible] with the Sellafield Site and located near the site.

The Sellafield nuclear site [illegible] that process and store used [illegible] other radioactive materials. [illegible] stores low-level radioactive [illegible] assessment specifically [illegible] equipment failures, natural [illegible] by human error or terrorist [illegible] activities at Sellafield or [illegible] scope of the commission [illegible] transportation of radioactive [illegible] discharges from Sellafield [illegible] and are within limits set by [illegible] radioactive materials in the [illegible] monitored by the Radiological [illegible]

This document briefly summarises the assessment about the Sellafield Site and the Low-Level Waste Repository, the methods used to assess the risks, and the risks to Ireland. The analysis assesses risks from the Waste Repository from its [illegible] materials and existing practices [illegible] constantly changing as [illegible] Sellafield and more waste [illegible] Repository. The Information [illegible]

1. Incidents involving radioactive sources under regulatory control

Ireland uses radioactive materials in the form of sealed and unsealed sources in support of industry, medical diagnosis and treatment and other societal infrastructure. To ensure the safety and security of all sources of radiation held throughout Ireland, the EPA operates a licensing system.

As of 1st January 2014 there were 1698 active licences which are divided into different bands including industrial, medical, educational/research and laboratories, distributor, dental, veterinary and custody only (see Figure 1). These bands are further subdivided into 'levels' which depend on the complexity of the process and the number and activity of sources and irradiating apparatus being held and/or used.

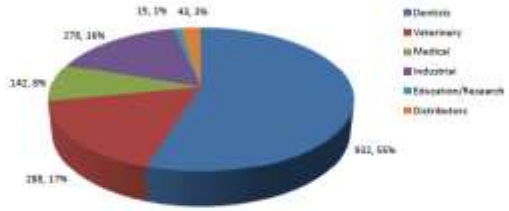

Figure 1. Licensees of Radiation Sources in Ireland by sector

In broad terms the following risks are associated with licensed sources:

Type of risk	Description of hazard
Loss or theft from storage location or during transit	Despite tight controls, loss/theft can occur. In responding to such events, it must be assumed that source may be with people who may not know its nature and hazard, who can handle it, break it and spread contamination. Hazard: The hazard depends on the type of radioactive source involved. For the highest hazard sources in Ireland (see list in Tables X to Y), unknowingly handling unshielded/unconfined sources could result in permanent injuries from external exposure or inadvertent ingestion and in localized contamination, requiring clean up.

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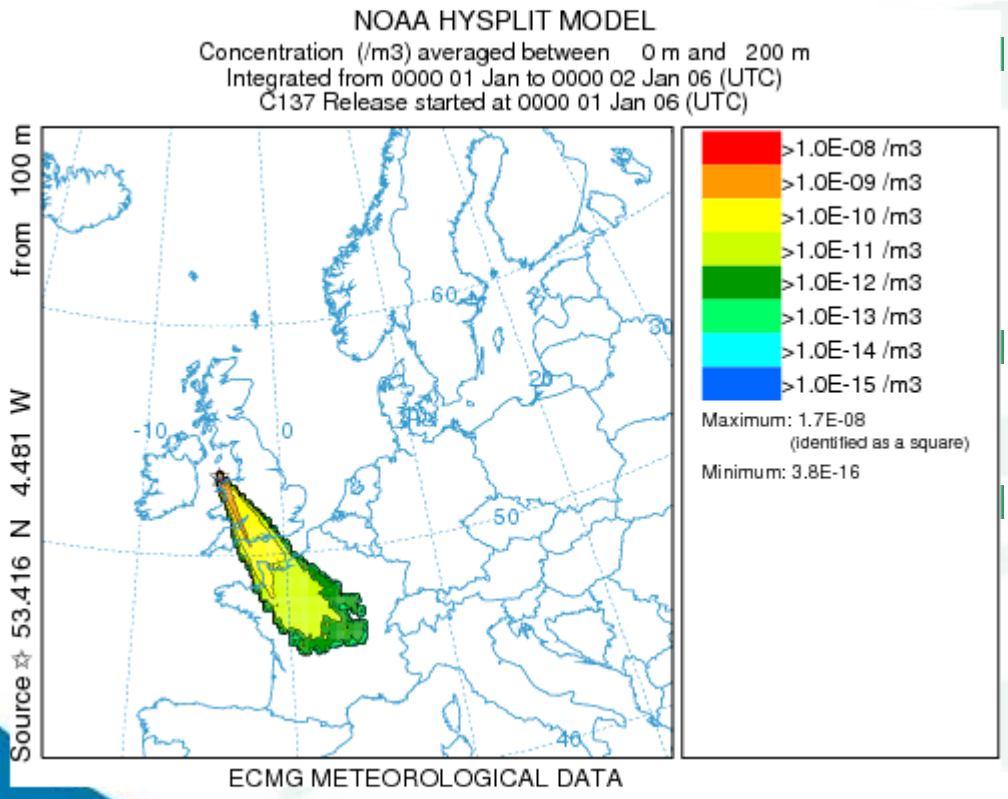
Environmental modelling



- Used computer prediction models
  - 21 years weather data
  - Average sea currents
- Calculated resulting environmental levels in Ireland
- Calculated radiation doses to people

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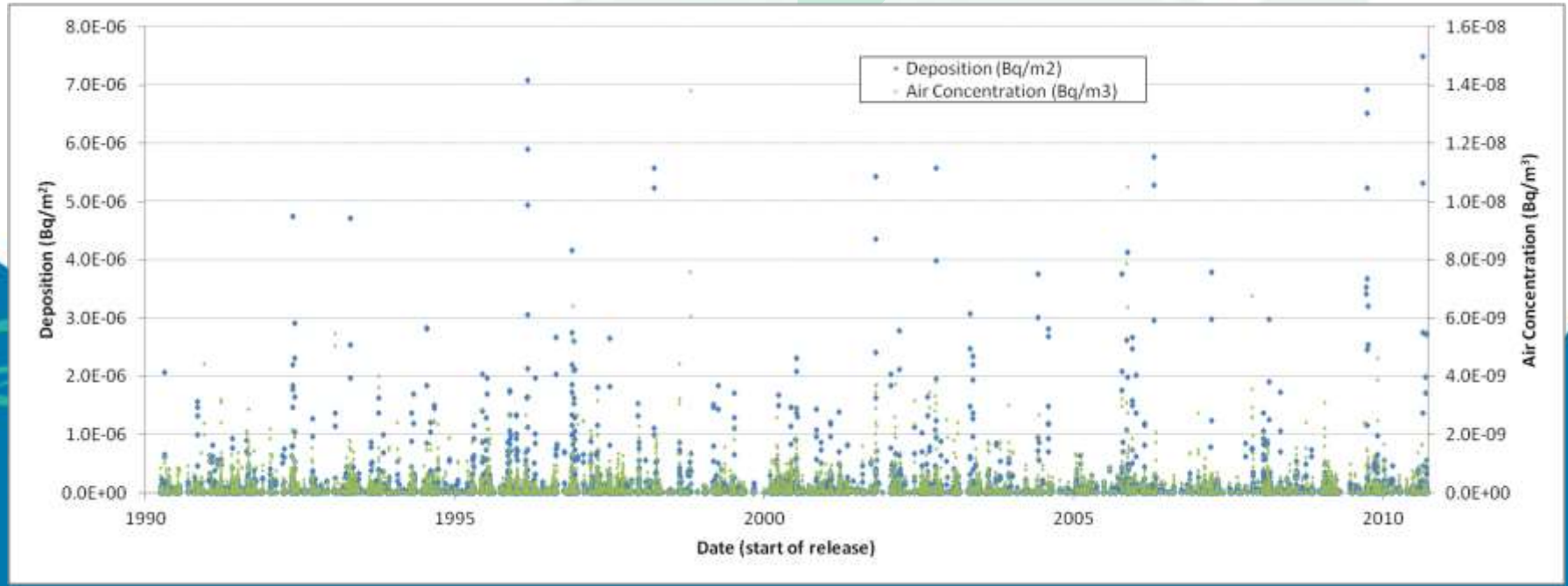
Identifying ‘worst case’ weather conditions

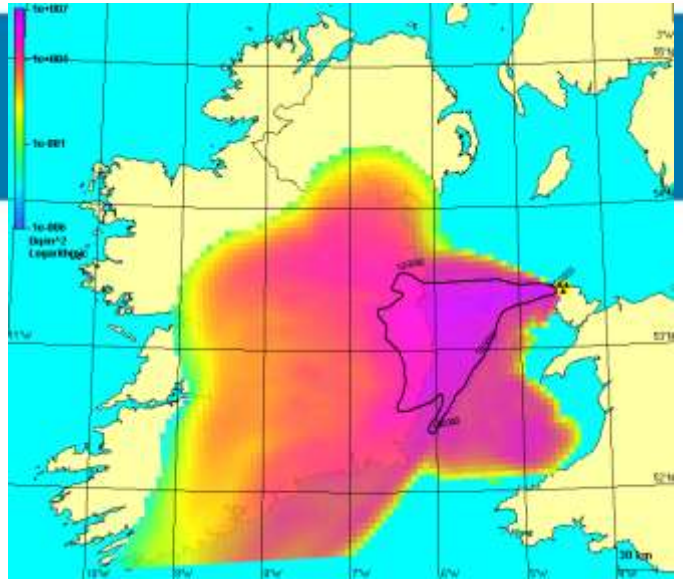
48 hour model run every 3 hours

Run model for each site

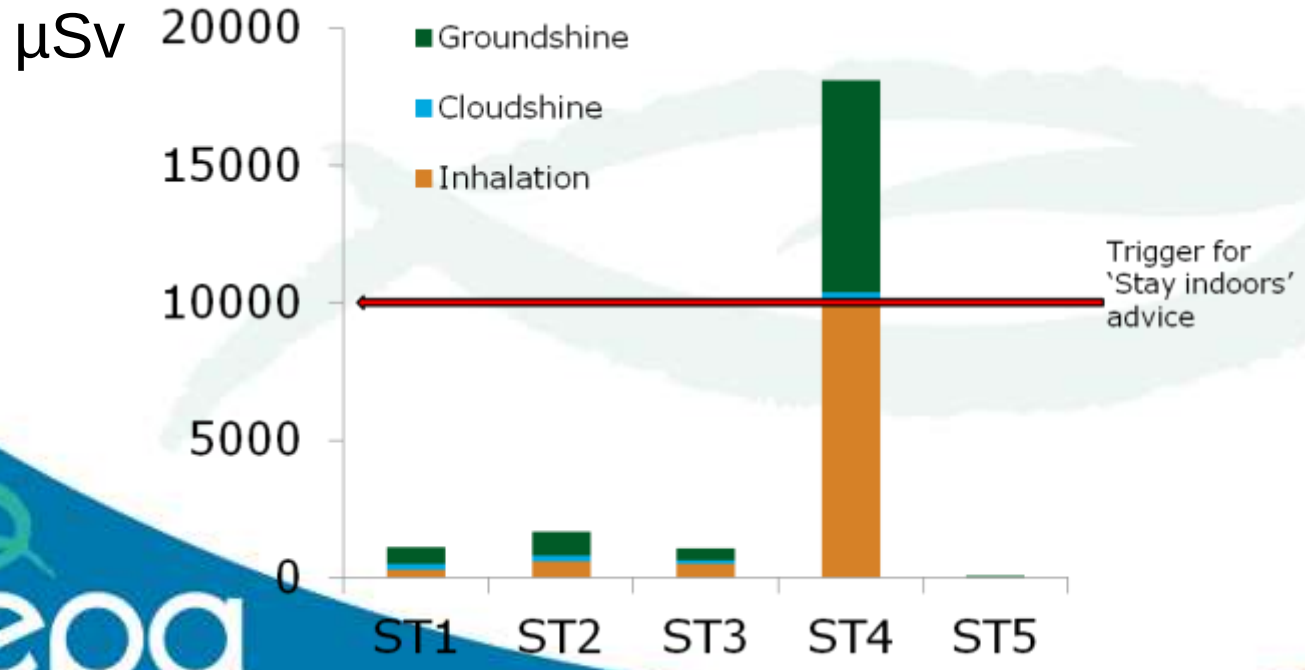
Identify maximum weather/site combination

Full assessment of this combination





Plume passage → 1 week → 1 year



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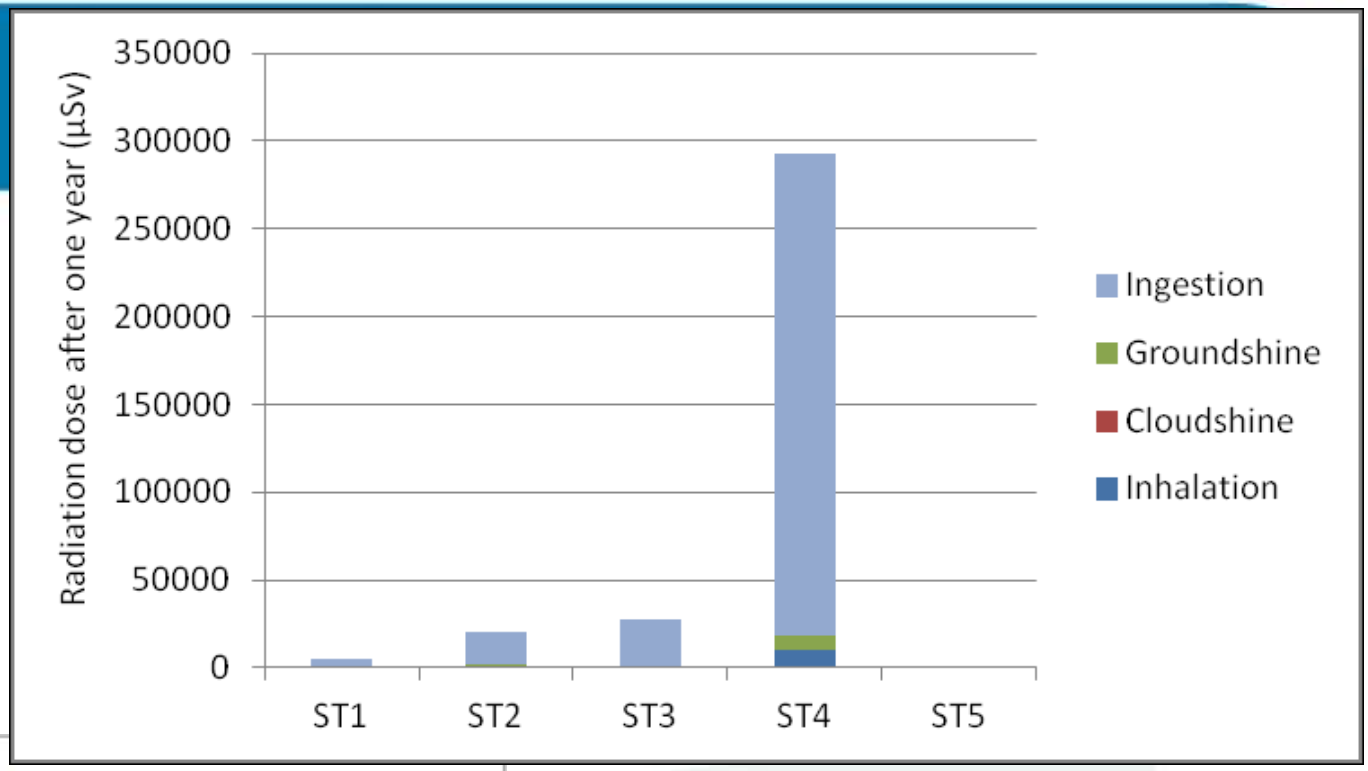
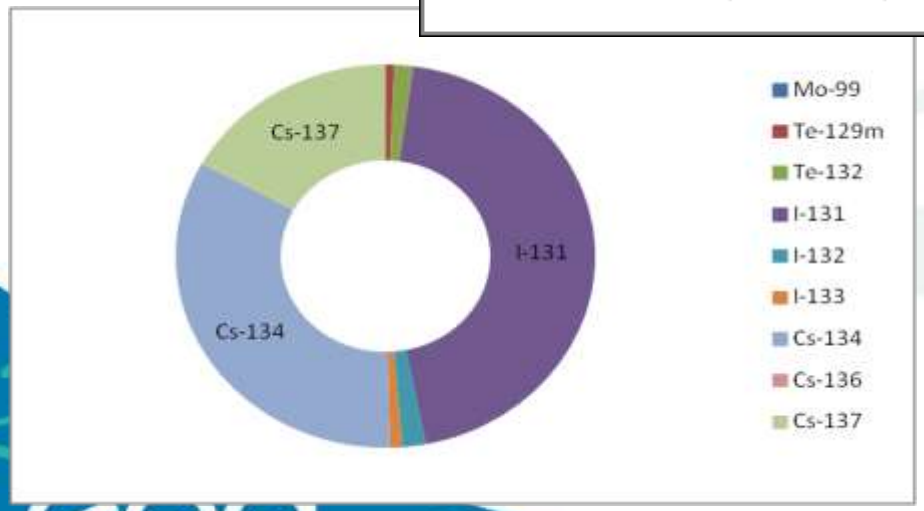
1 year





Ingestion dose by radionuclide

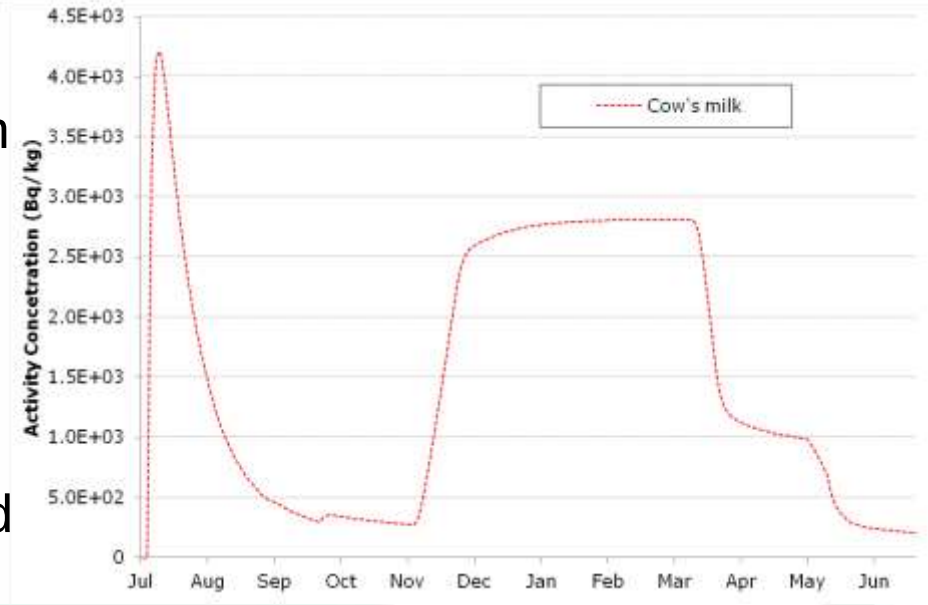
Contamination of food:

•Date of accident assumed was at height of summer – maximised impact on food

•Compared predicted levels in food with EU Maximum Permitted Levels

•Would generally need food controls/agricultural protective actions

•Length of time needed – would depend on severity of accident/weather/time of year



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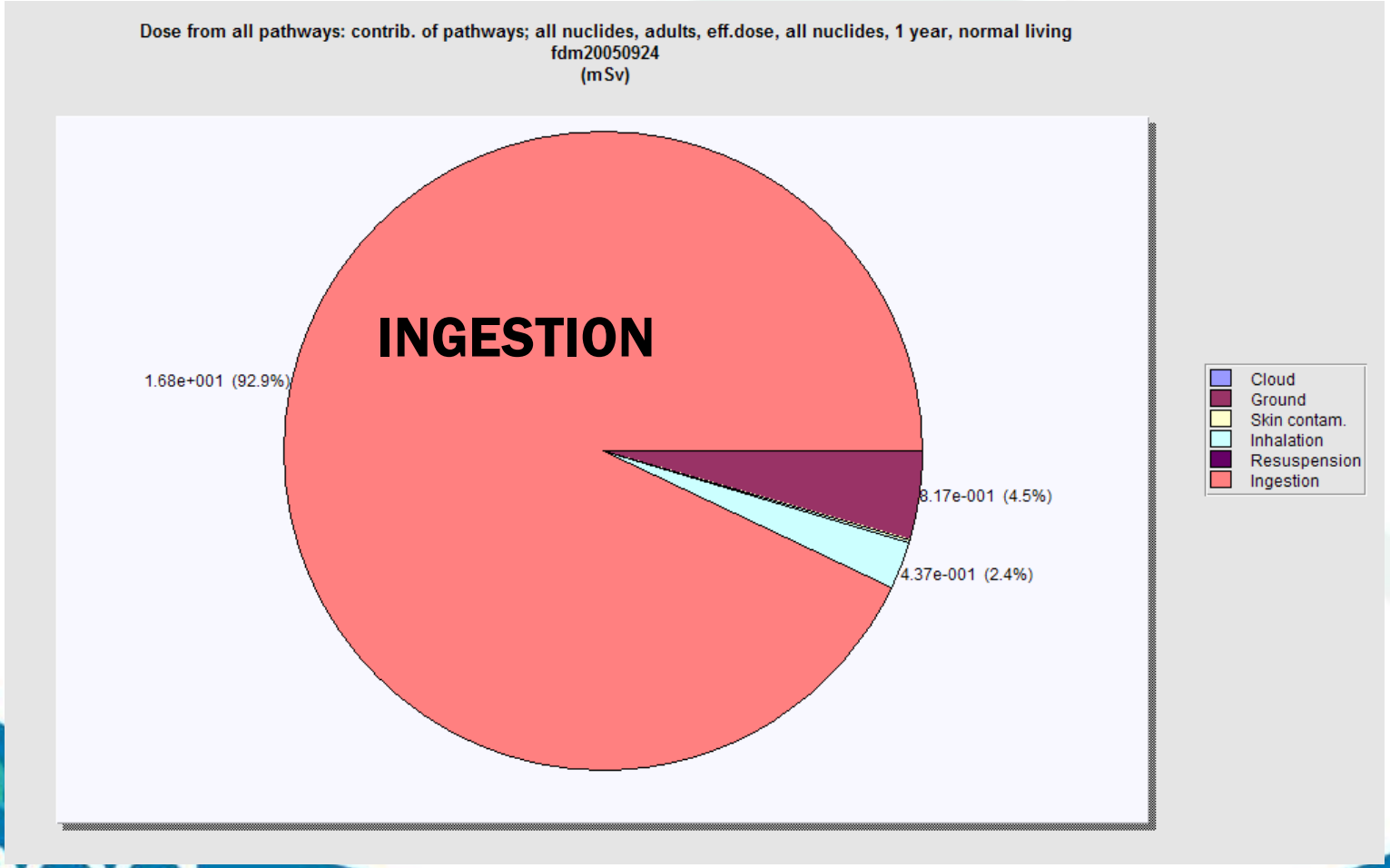
Contribution from different pathways to dose (typical)



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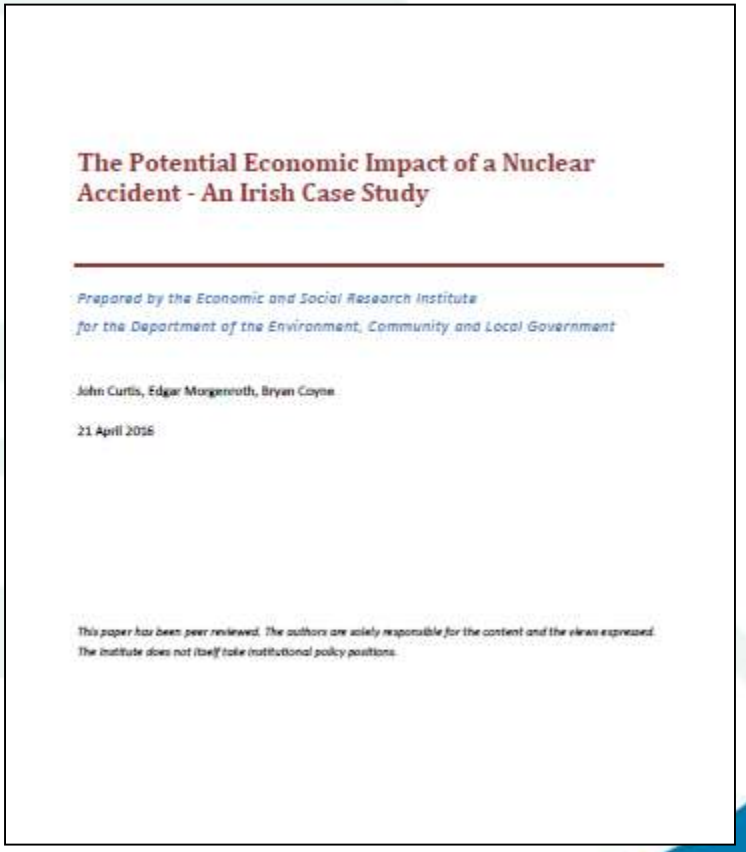
Economic consequences

- Economic & Social Research Institute
- 4 scenarios
- Costs to economy
  - Agriculture
  - Tourism
  - Business (lost days)
  - Monitoring costs

➢ €4bn to €160bn



The Potential Economic Impact of a Nuclear Accident - An Irish Case Study

Prepared by the Economic and Social Research Institute
for the Department of the Environment, Community and Local Government

John Curtis, Edgar Morgenroth, Bryan Coyne

21 April 2016

This paper has been peer reviewed. The authors are solely responsible for the content and the views expressed. The institute does not itself take institutional policy positions.

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Summary of hazard assessment

- Following a nuclear accident abroad the most significant route of potential exposure would be the consumption of contaminated food
- Most of the ingestion dose could be averted through the introduction of protective actions to reduce the transfer of radioactivity to food products and by restricting the sale of contaminated food
- Importance of agriculture and food to Ireland's economy
  - 15% of the world's infant formula is made in Ireland
  - Ireland is the 5th largest exporter of beef in the world

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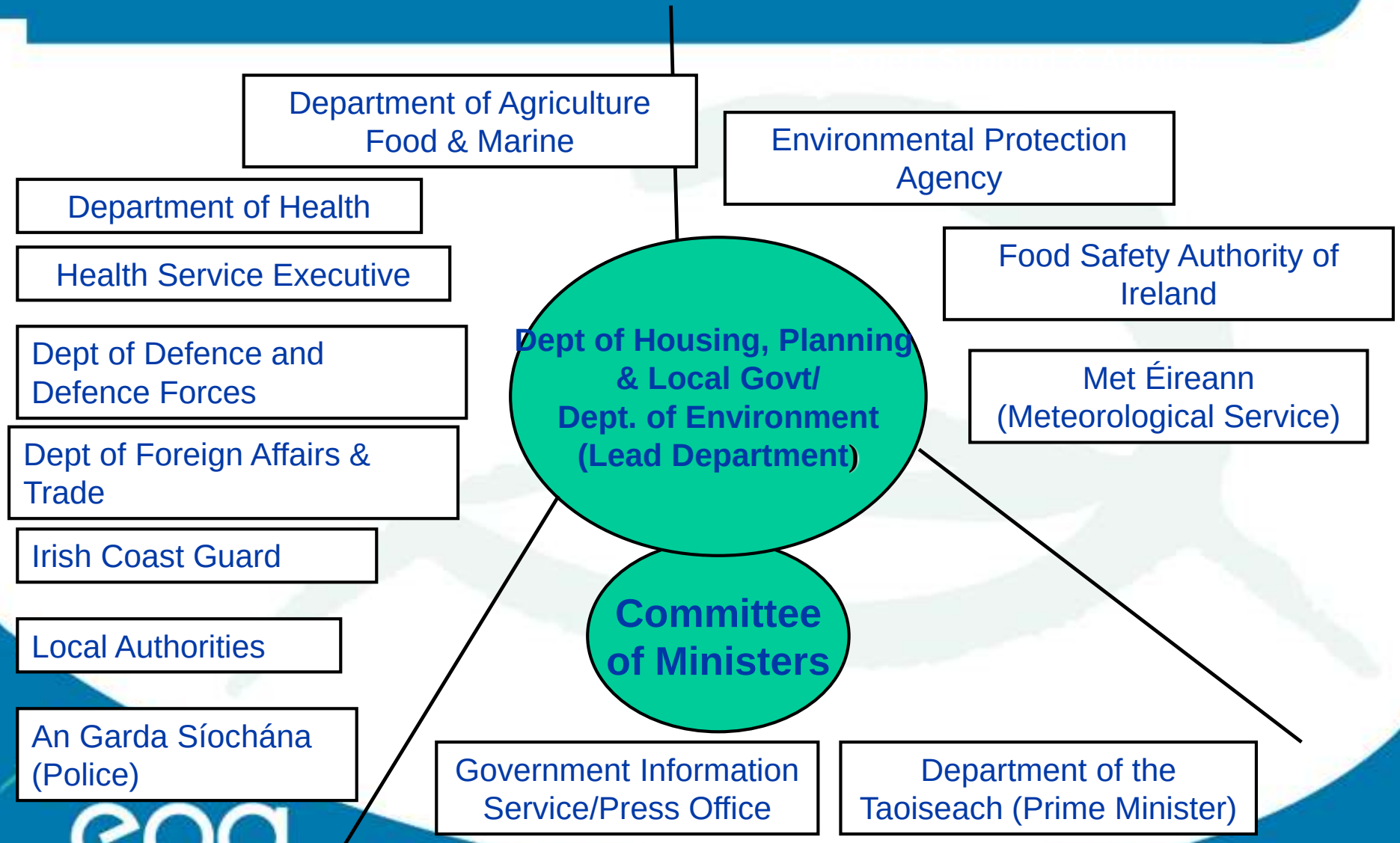
Emergency Planning in Ireland – some key principles

- Lead Government Department
- All of Government response:
  - Government Taskforce on Emergency Planning
  - National Coordination Group on _____ (nuclear accident)
- Linkage between National Plans (National Emergency Coordination Centre, Dublin) and local level (Major Emergency Local/Regional Coordinat Centres)
- National Framework for emergencies

National Emergency Coordination Committee



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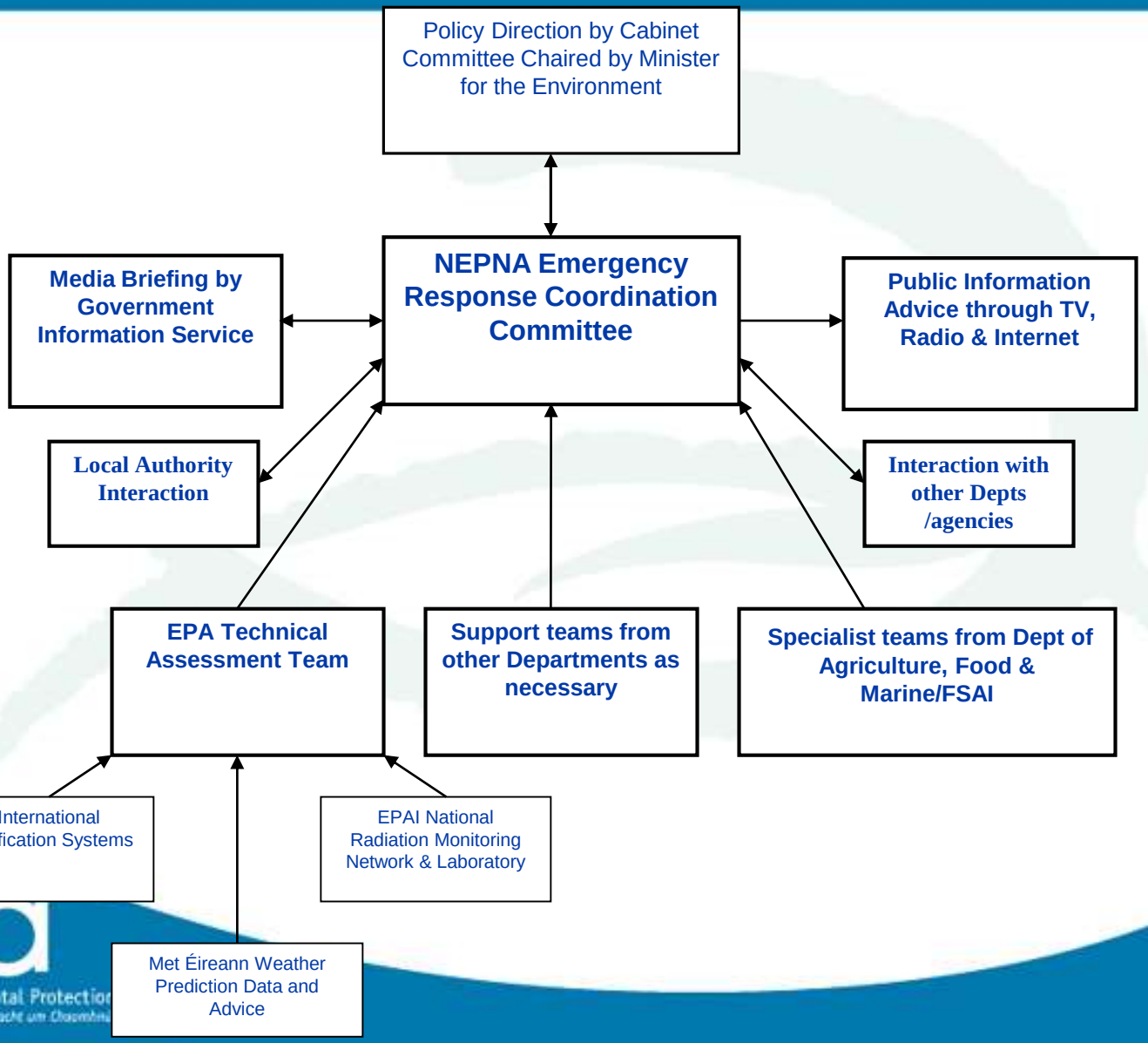
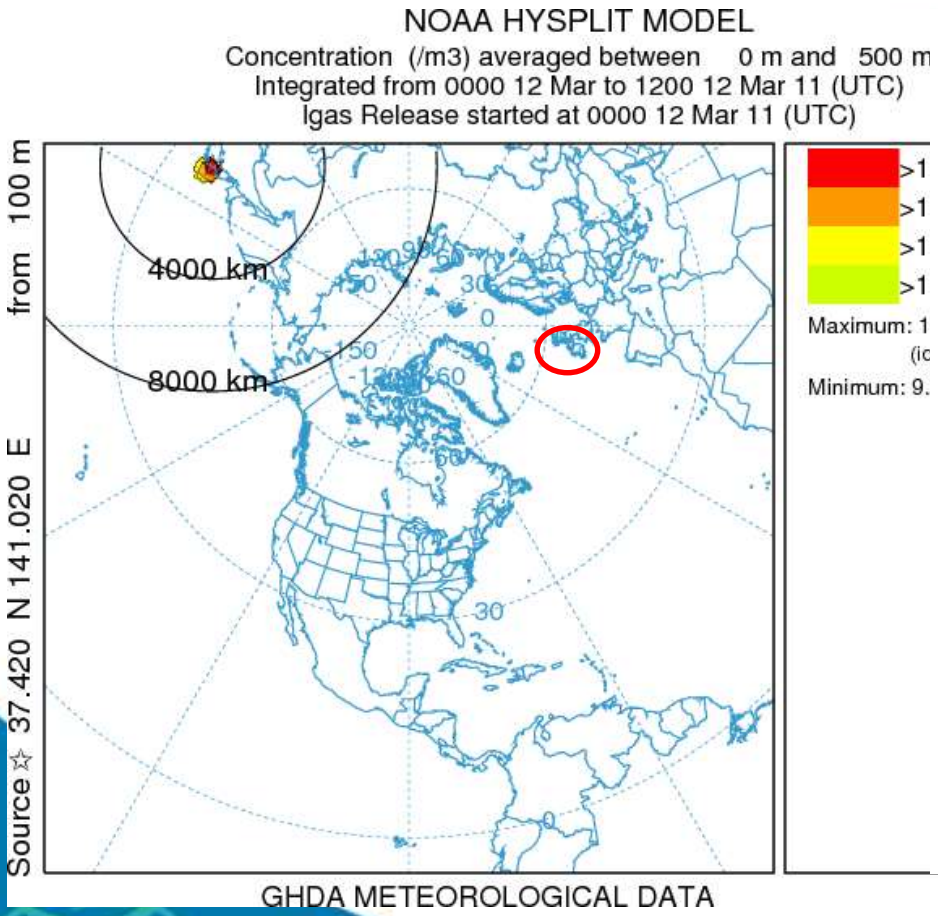

Policy Direction by Cabinet Committee Chaired by Minister for the Environment
NEPNA Emergency Response Coordination Committee
Media Briefing by Government Information Service
Public Information Advice through TV, Radio & Internet
Local Authority Interaction
Interaction with other Depts /agencies
EPA Technical Assessment Team
Support teams from other Departments as necessary
Specialist teams from Dept of Agriculture, Food & Marine/FSAI
International Notification Systems
EPAI National Radiation Monitoring Network & Laboratory
Met Éireann Weather Prediction Data and Advice

EPA Roles in an emergency



- Duty officer: assess notifications/alerts
- Briefings to Departments/Agencies
- Modelling/Measurement of radioactivity in environment and food/feed
- Food and pharmaceutical imports/exports testing
- Information to media/public
- Advice to Irish citizens abroad (through DFA)

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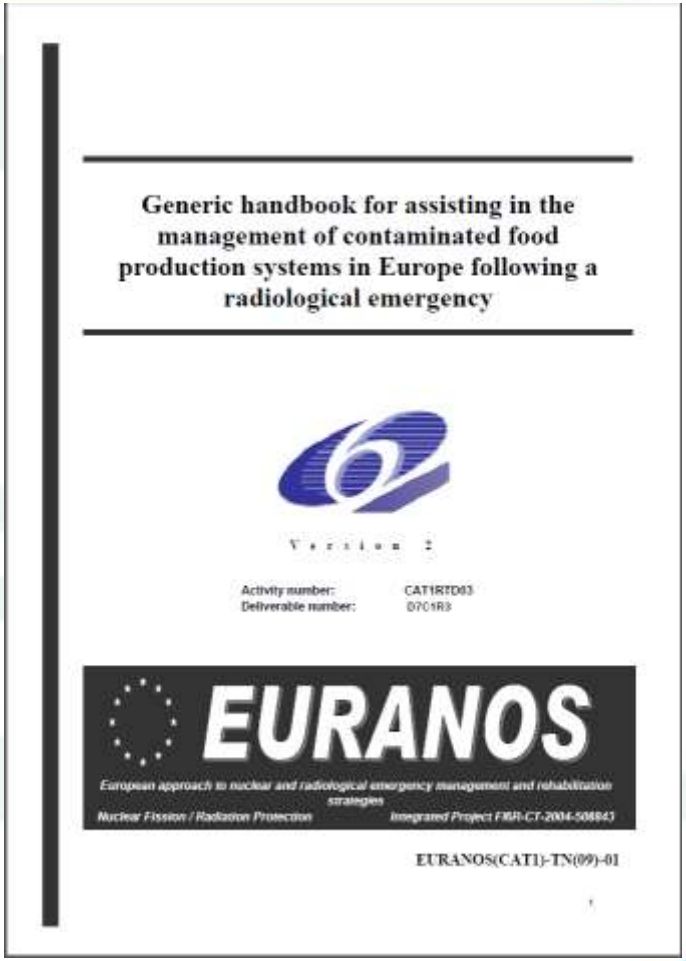
Malin Head
Belmullet
Clones
Dundalk Aerodrome
Dundalk Gamma
Knock Airport
Drogheda
Kiltrough
Mullingar
Glasnevin
Belfield
Clonskeagh
Casement Aerodrome
Galway
Birr
Ballyrichard
Shannon Airport
Kilkenny
Kilmeadan
Rosslare
Cahirciveen
Cork Airport

EURANOS Food Handbook

- In 2009, a multi-disciplinary group was set up to customise the EURANOS food handbook for Irish conditions – the Irish Food Handbook

- This group comprised agricultural, sea fishery protection, veterinary, food safety, environmental protection and radiation protection experts.



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Stakeholder engagement: Panel

- Dept of Agriculture
- Food Safety Authority
- EPA
- Dept of Environment
- Seafood Protection Agency
- Meat Industry body
- Dairy industry body
- National Consumer Agency
- Grain & Feed industry body
- Irish Farmers' Union
- Large retail organisations (supermarkets)

PREPARE

EUROPEAN JOINT PROGRAMME FOR THE INTEGRATION OF RADIATION PROTECTION RESEARCH
CONCERT

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Key Outcome from Panel Discussions

One of the most important issues in the event of a nuclear emergency is good **communications**

Communications with
- Farmers
- Processors
- Suppliers
- Retailers
- Consumers

Communications between industries is also very important e.g. between suppliers and processors

Therefore, all the stakeholders in the food industry must be involved in the communications plan

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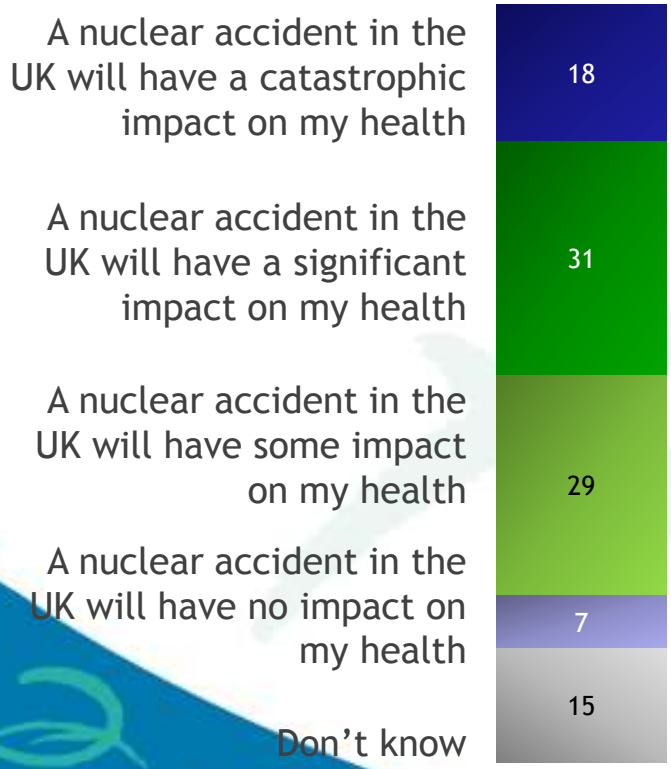
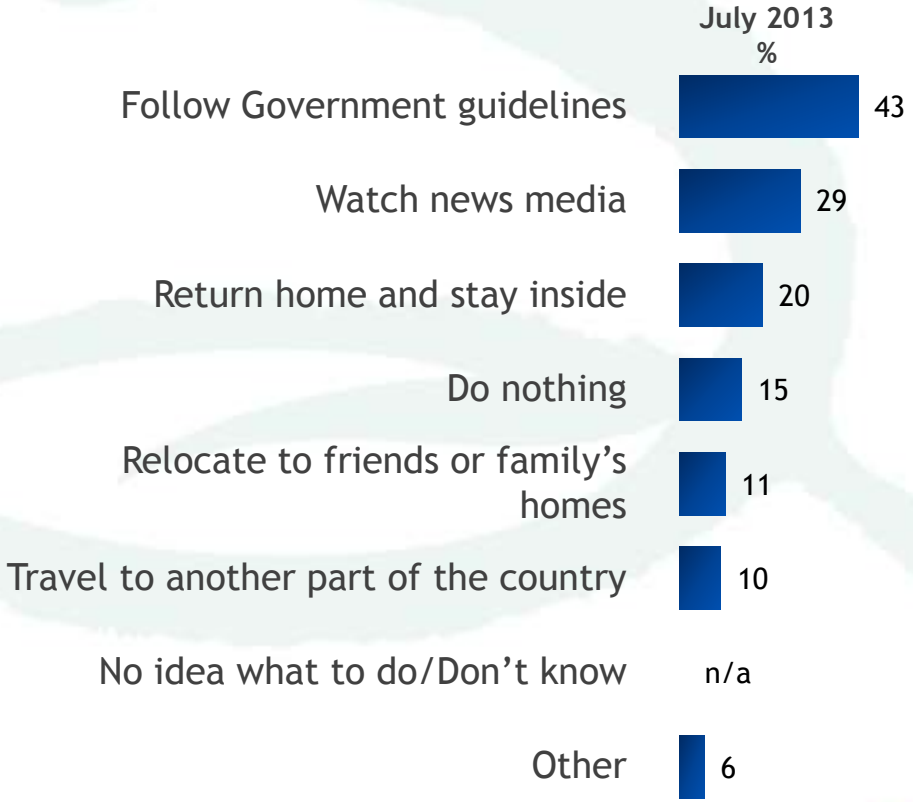
Q.10 – Q12 Please tell me which one of the statements on this card you agree with?



Q.13 In the event of a nuclear accident in the UK, what would you do?



Base: All aged 15+ n=1000)

Communication in an emergency

- Sub-Group of National Emergency Coordination Group
- Coordinate messaging across all Gov’t organisations

- Media (Radio, TV)
- Website: central and main organisations
- Social media (Twitter)
- Press conferences
- Direct to key business groups (agri-food)

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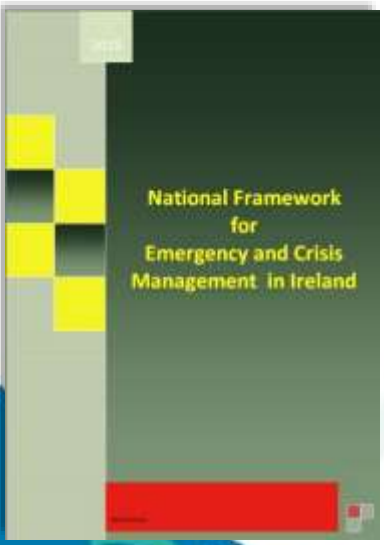
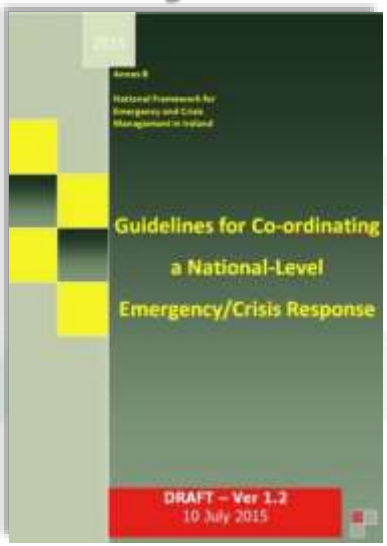
Further work

- Currently finalising major revision to the National Emergency Plan for Nuclear Accidents
- Maintaining Stakeholder Panel

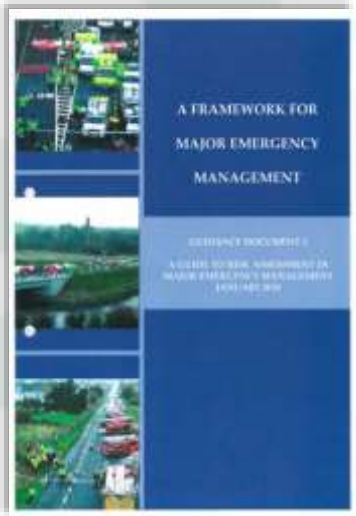
Nationally





New National Framework 2017

Nationally, Regionally & Locally



The MEM Framework is for the main PRAs, i.e. the Gardaí, HSE and Local Authorities

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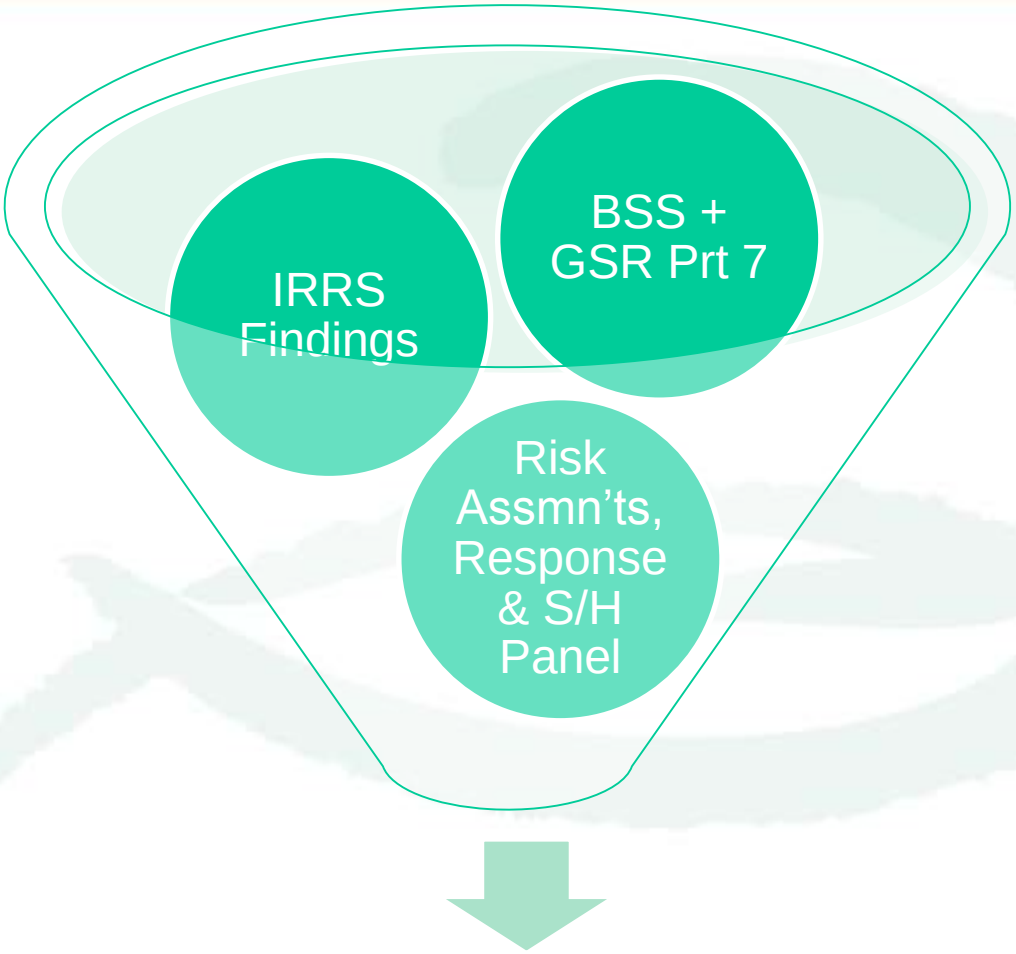

Revised National Emergency Plan for Nuclear Accidents

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Final Words

Thank you to my co-authors:

Veronica Smith and Robert Ryan (EPA)

Keith Leonard (National Directorate for Fire and Emergency Management)

Thank you for your attention

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