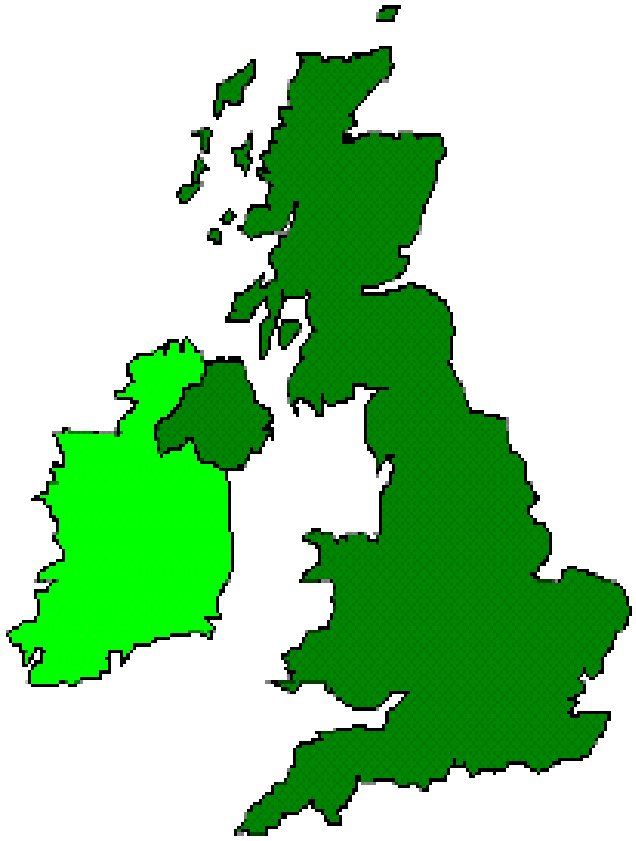
JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE



The United Kingdom of Great Britain and Northern Ireland

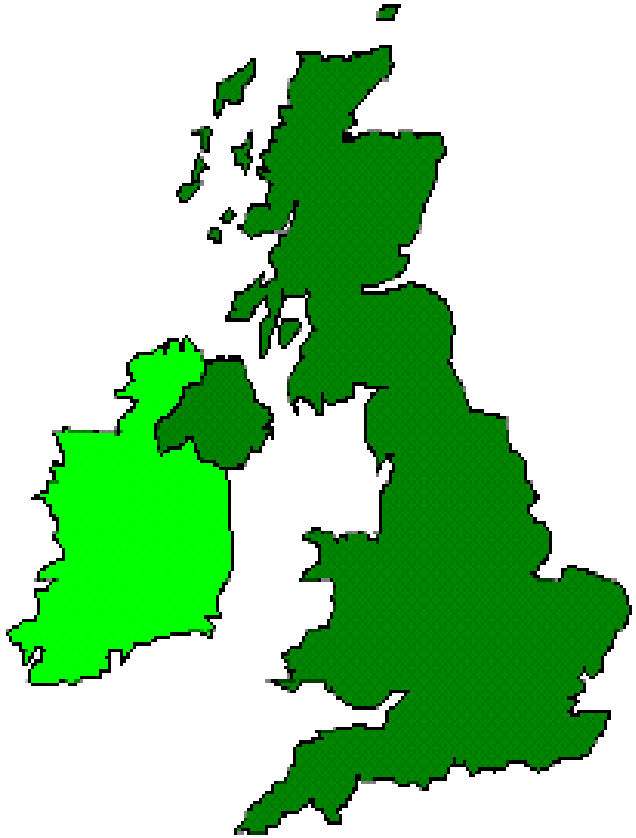
NATIONAL REPORT PRESENTATION

For the

First Review Meeting

3rd to 14th November 2003, Vienna

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE



Presented

By

Dr Mike Weightman

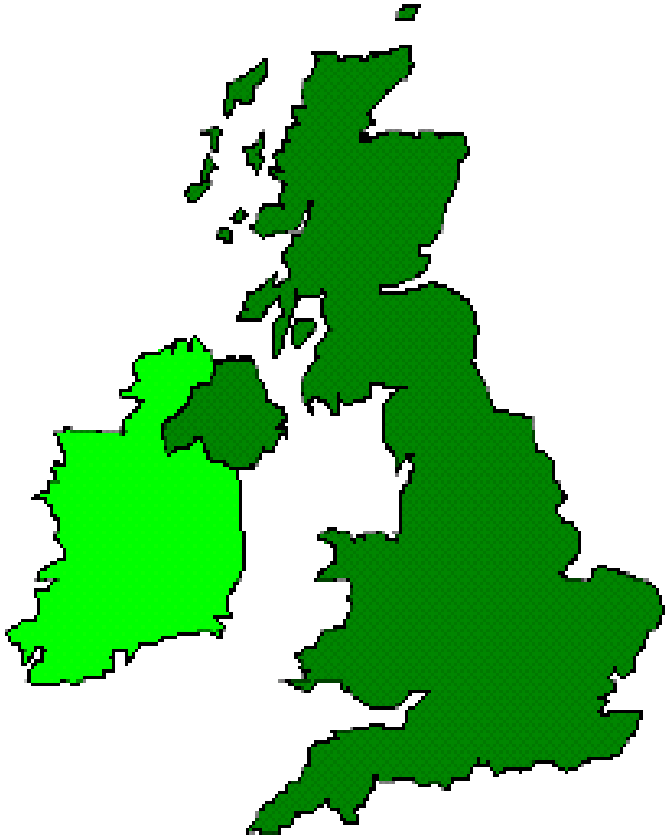
HM Deputy Chief Inspector of Nuclear Installations,

Health & Safety Executive

PRESENTATION STRUCTURE

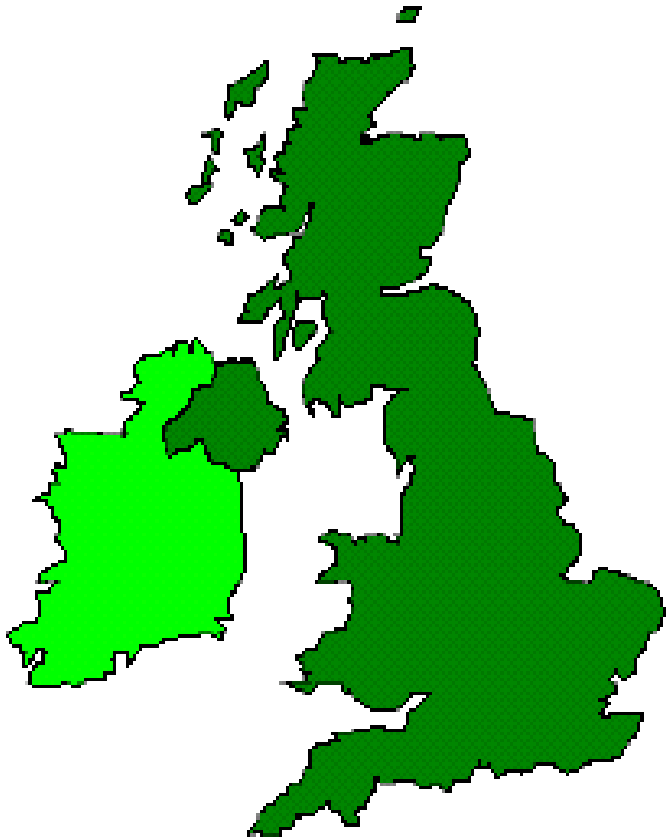
- **Introduction**
- **General Safety Provisions**
- **Safety of Spent Fuel Management**
- **Safety of Radioactive Waste Management**
- **Improving Safety**
- **Questions and Comments**

INTRODUCTION



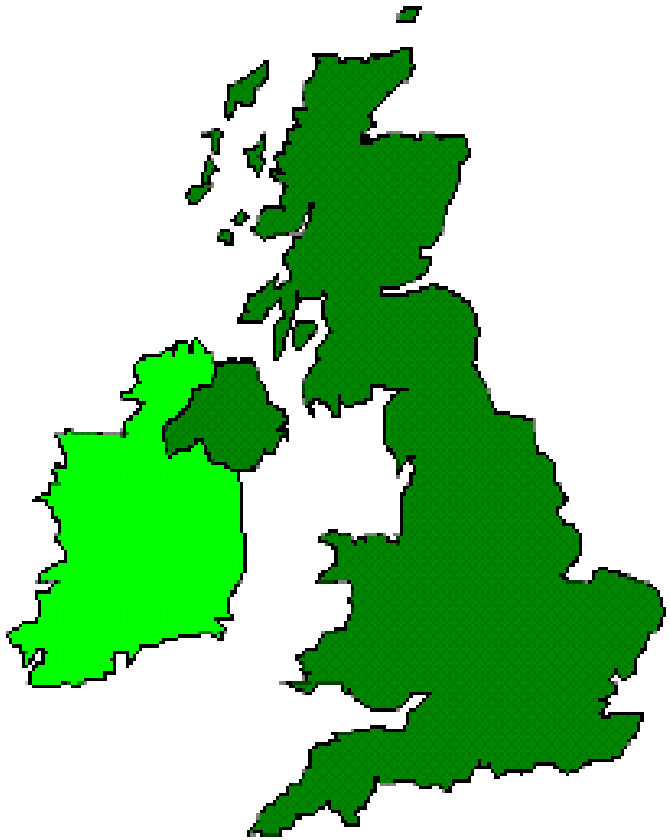
- Report
- Scope
- Historical Background
- Facilities
- Inventories
- Basic Policies

THE UK REPORT



- **Prepared from inputs of Government Departments, Regulatory Bodies, and Industry.**
- **Explains how the UK achieves and maintains a high level of safety and environmental protection in spent fuel and radioactive waste management.**

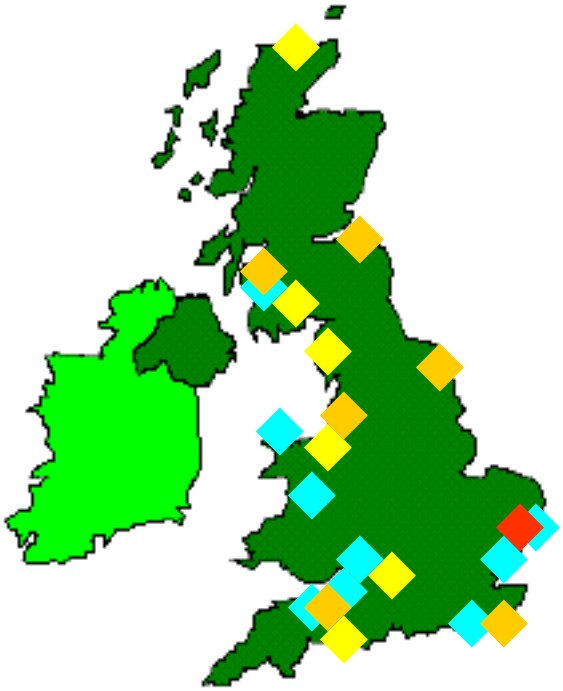
SCOPE



- ✓ **Reprocessing**
- X **Naturally occurring radioactive material**
- X **Defence programme waste**

HISTORY OF UK NUCLEAR INDUSTRY

1945 **to** **2003**



1940-★-1950----1960----1970----1980-----1990-----2000-

1945

UK Government Decision to undertake an atomic energy programme

1940-★-1950----1960----1970----1980-----1990-----2000-

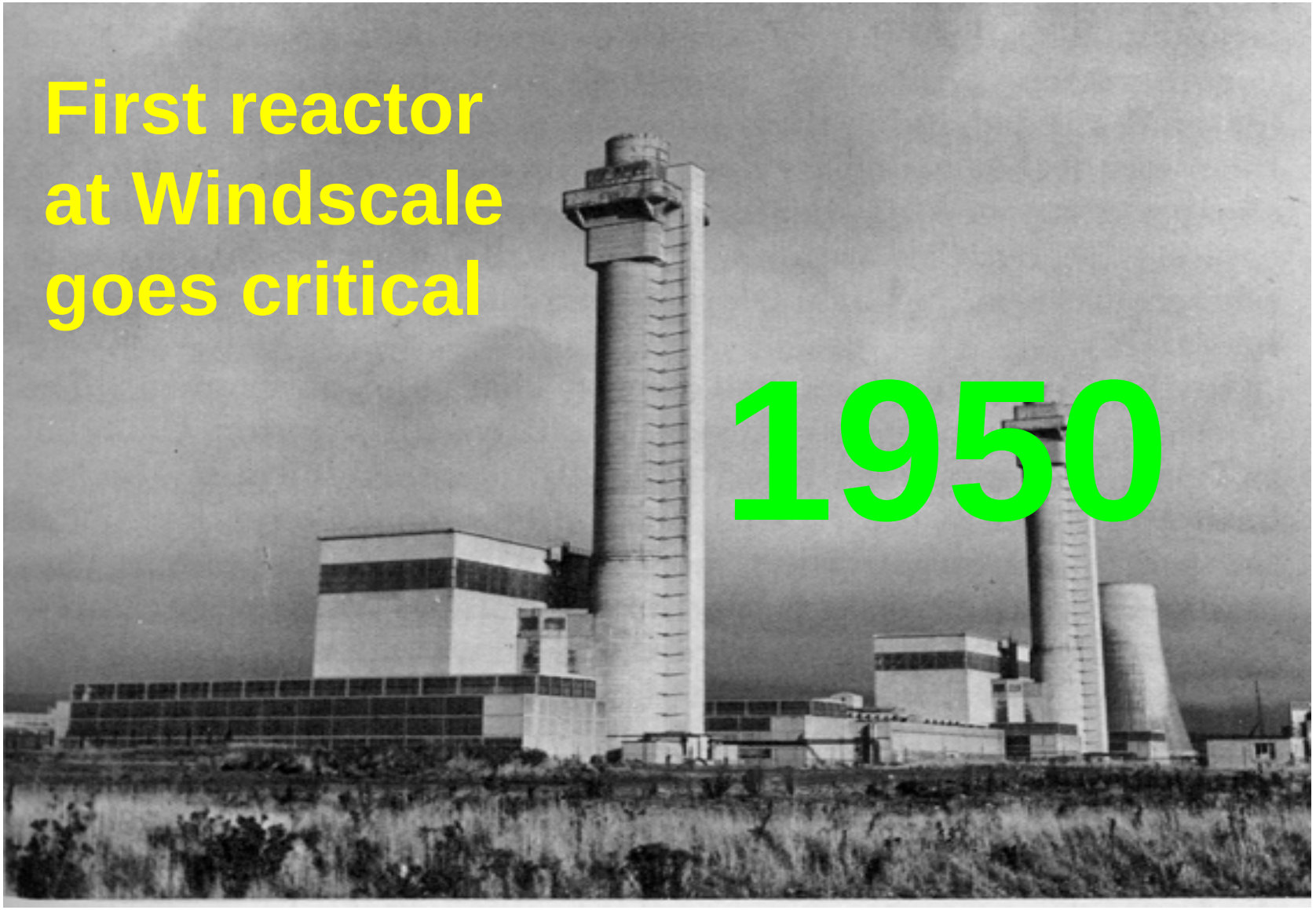
1946 - AERE Harwell established


Work starts on construction of air cooled reactors at Windscale and associated reprocessing and radioactive waste management facilities
1947

1940---1950----1960----1970----1980-----1990-----2000-

1949

Work starts on enrichment facility at Capenhurst


First reactor
at Windscale
goes critical
1950

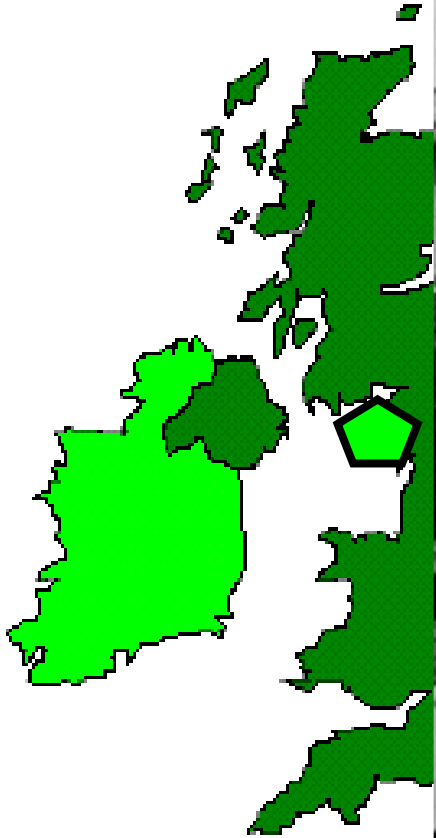
1940----1950----1960----1970----1980-----1990-----2000-

1953

Government Decision to build a commercial nuclear power station

1940----1950----1960----1970----1980-----1990-----2000-

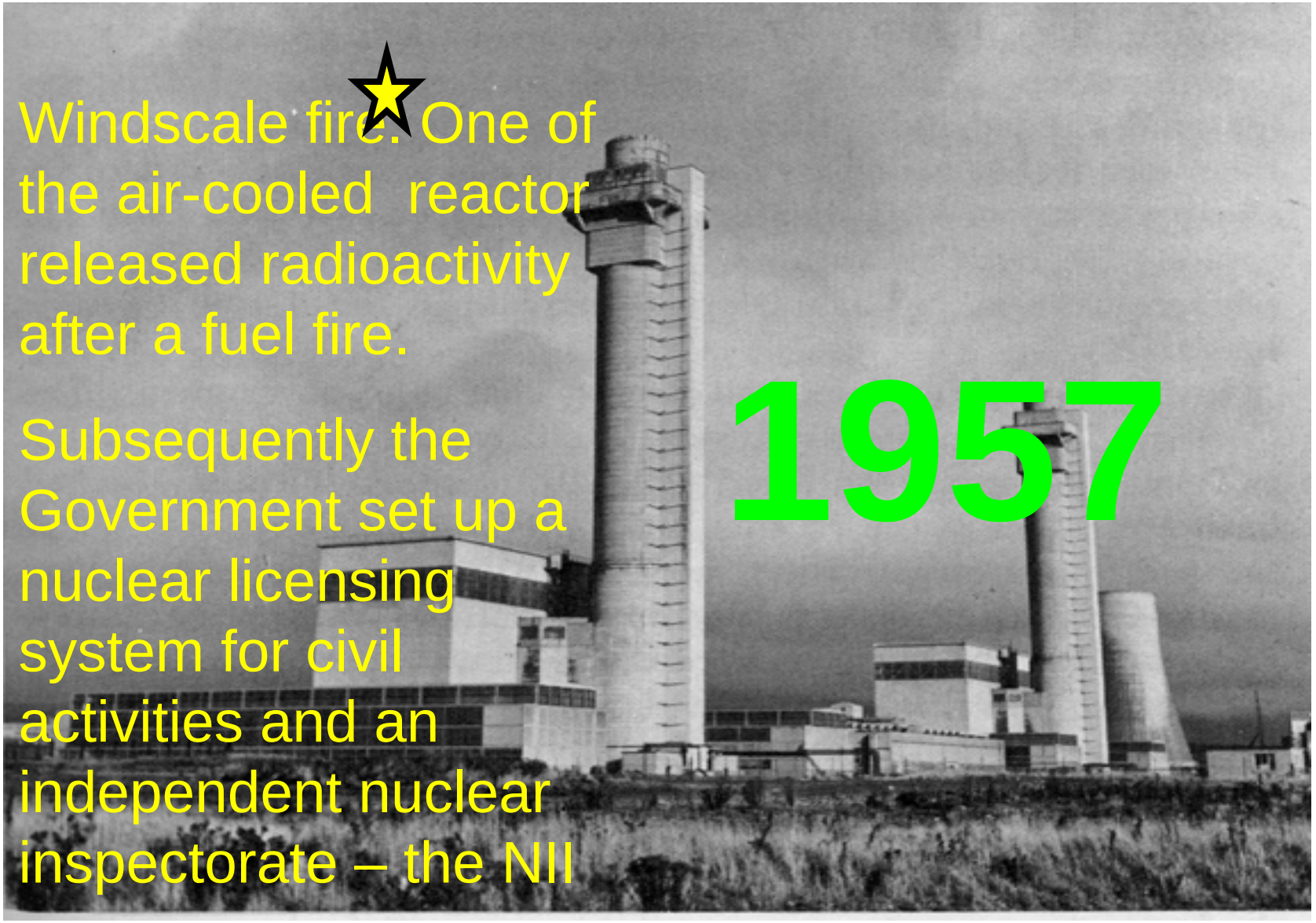
1940----1950----1960



HM Queen opens Calder Hall

1st commercial nuclear power station

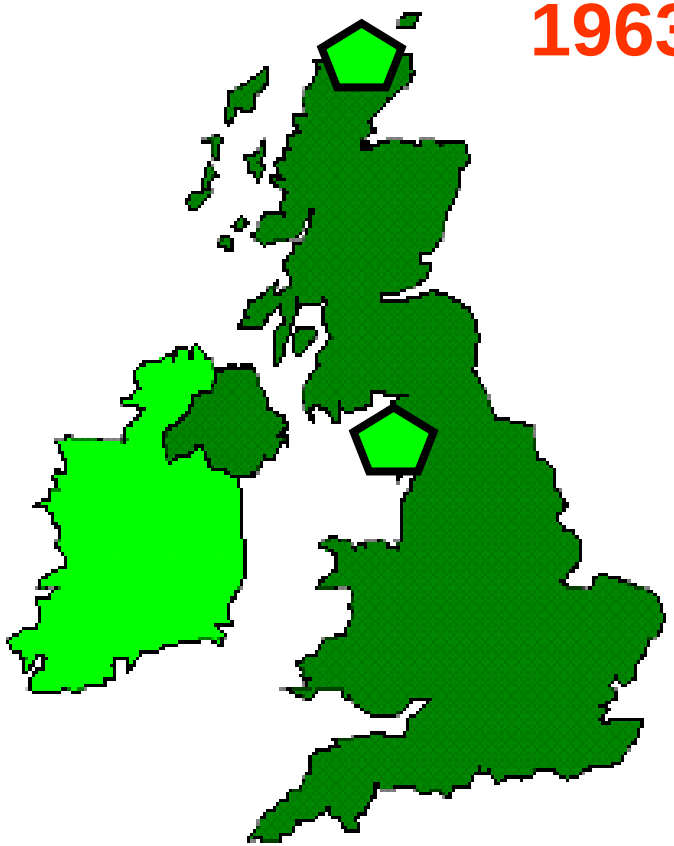
1956


Windscale fire: One of the air-cooled reactor released radioactivity after a fuel fire.
Subsequently the Government set up a nuclear licensing system for civil activities and an independent nuclear inspectorate – the NII
1957


1960s – Large scale reprocessing of Magnox fuel commences
1960s
Magnox reprocessing plant under construction

1940----1950----1960----1970----1980-----1990-----2000-

1940----1950----1960----1970----1980-----1990-----2000-



1963

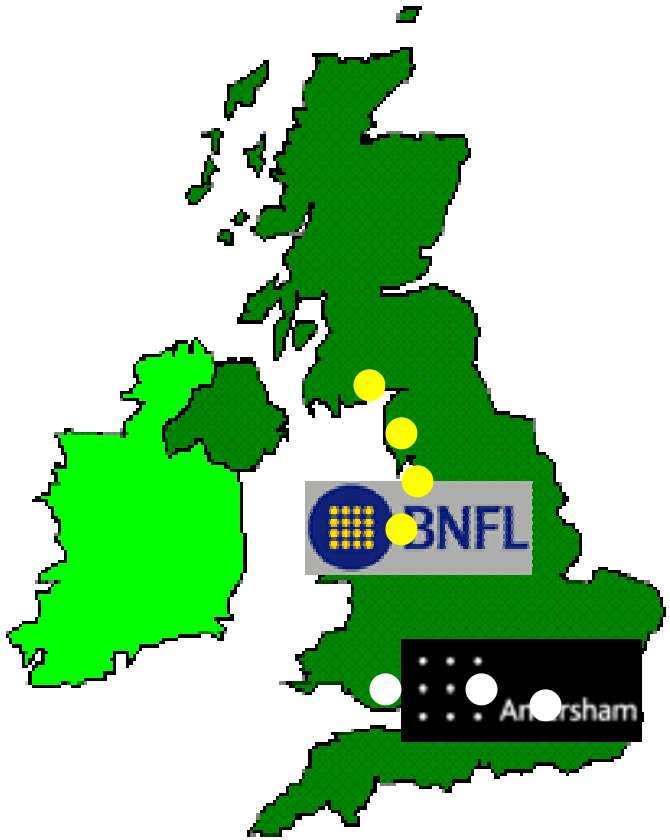
Demonstration Fast Reactor (DFR) starts operation at Dounreay

1940----1950----1960----1970----1980-----1990-----2000-

1968

Prototype SGHWR starts operation at Winfrith

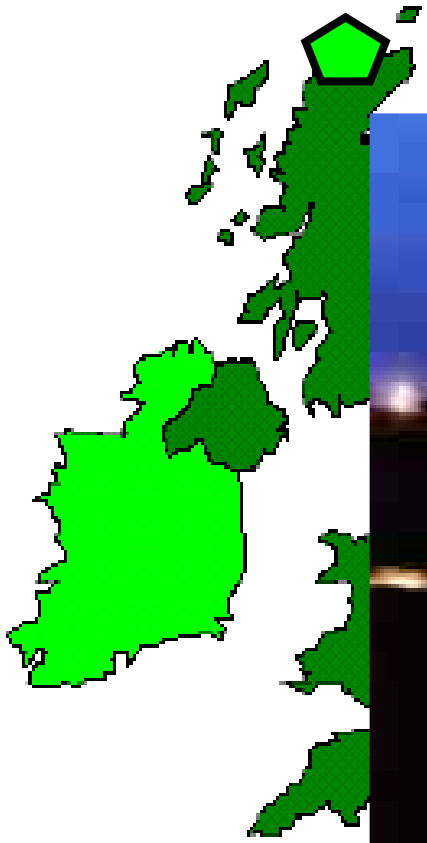
1940----1950----1960----197★---1980-----1990-----2000-



1971

Atomic Energy Authority Act establishes British Nuclear Fuels Limited (BNFL) and the Radiochemical Centre Ltd (later became Amersham International)

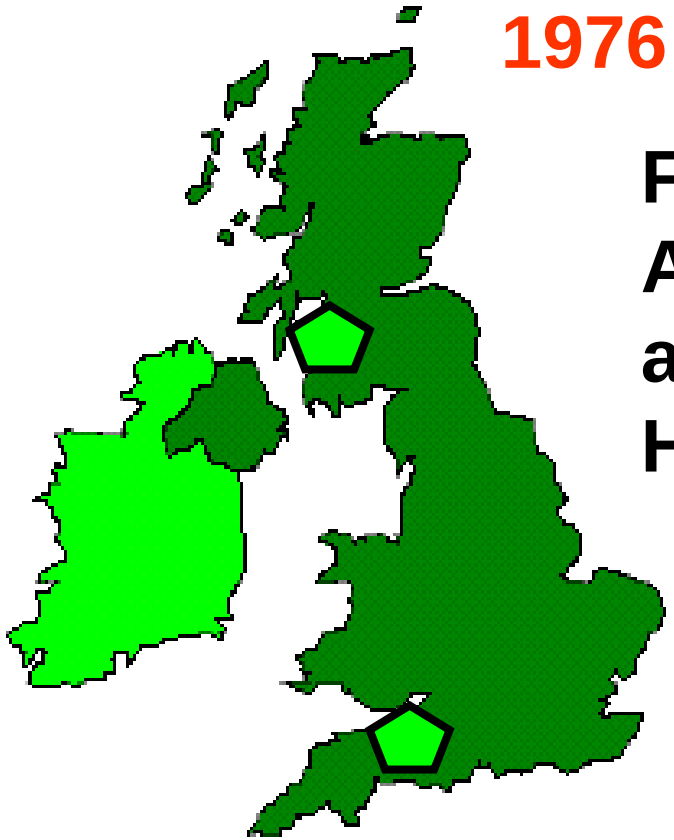
1940----1950----1960----1970----1980-----1990-----2000-



1974

Prototype Fast Reactor (PFR) starts operation at Dounreay

1940----1950----1960----1970--★1980-----1990-----2000-



1976

First Commercial AGRs start operation at Hinkley Point and Hunterston


Prototype AGR at Windscale shuts down permanently – now at advanced stage of decommissioning
1981

1940----1950----1960----1970----1980----1990-----2000-

1983

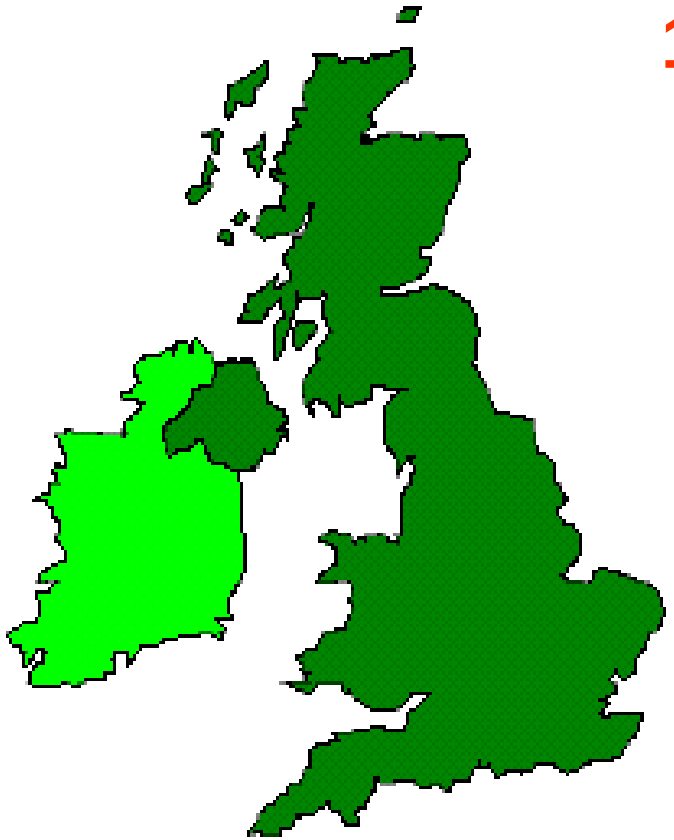
Agreement to end sea dumping of radioactive waste.

1940----1950----1960----1970----1980-----1990-----2000-

1989

Berkeley Magnox Station shuts down

1940----1950----1960----1970----1980-----1990-----2000-

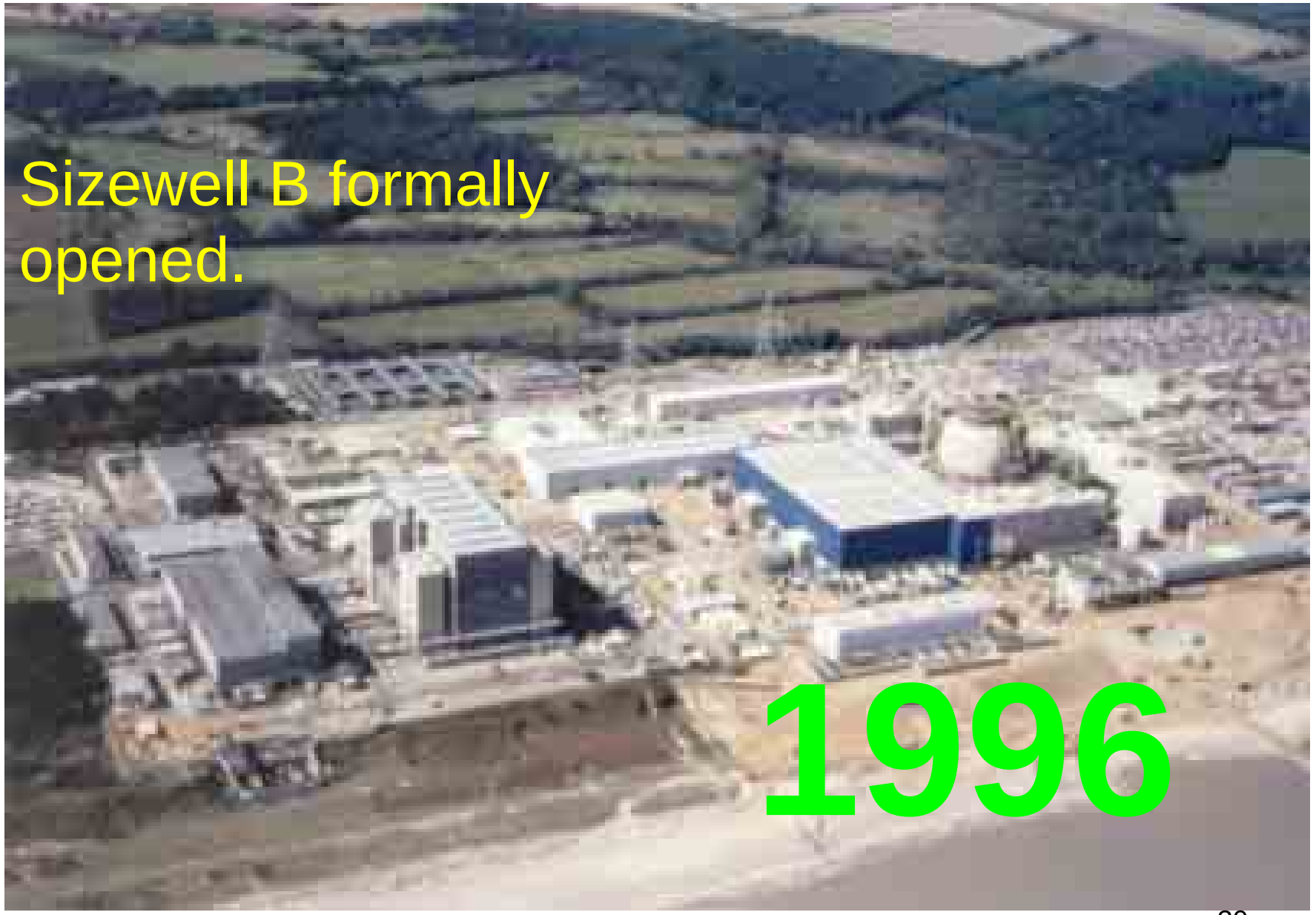


1990

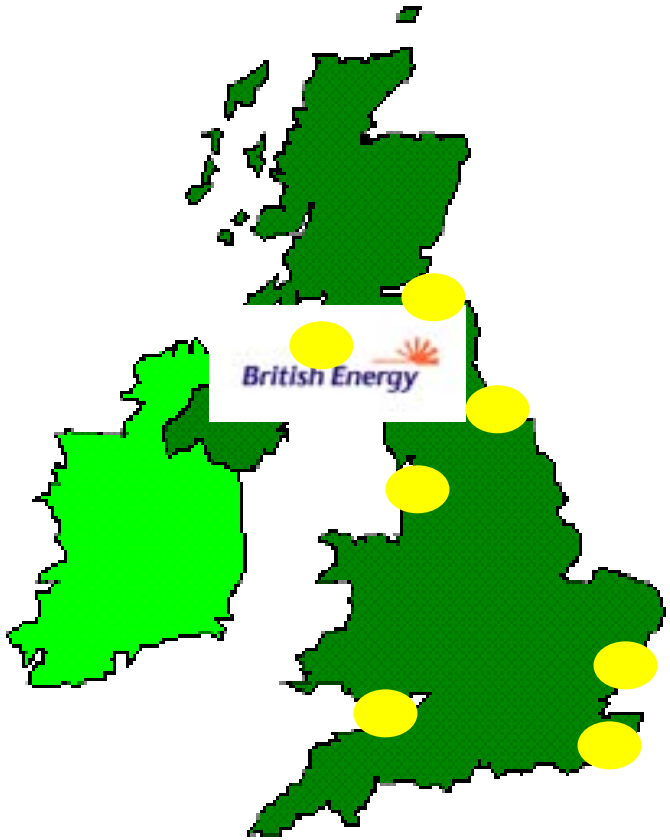
Electricity Act establishes Nuclear Electric and Scottish Nuclear. Both retained in public sector.

An aerial view of the Dounreay site as it was in the late 1970s.


Oxide fuel reprocessing commences in THORP
1994


Sizewell B formally opened.
1996

1940----1950----1960----1970----1980-----1990---2000-

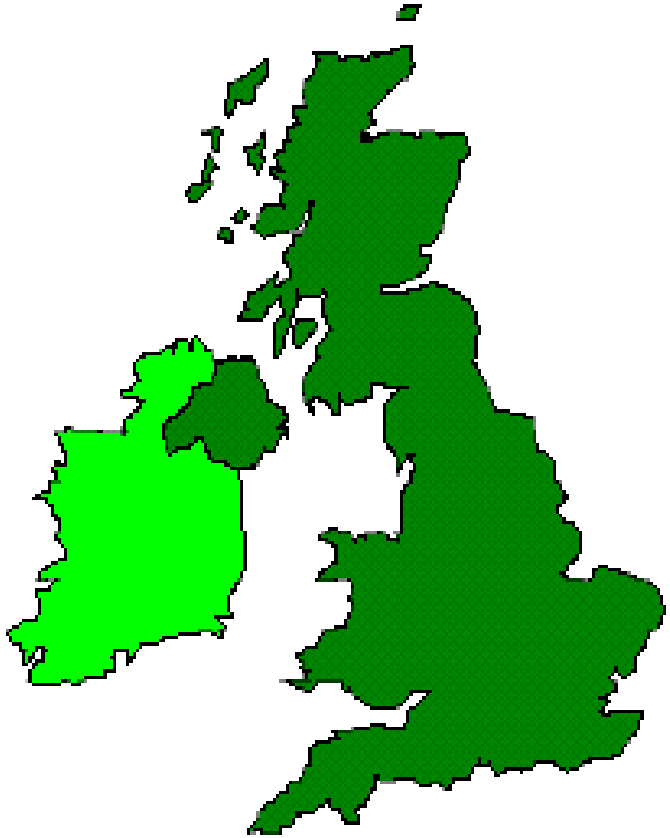


1996

British Energy privatised with AGR & Sizewell B.

Magnox stations stay in public ownership

1940----1950----1960----1970----1980-----1990----2000-



1997

Case for rock characterisation facility near Sellafield rejected by public inquiry

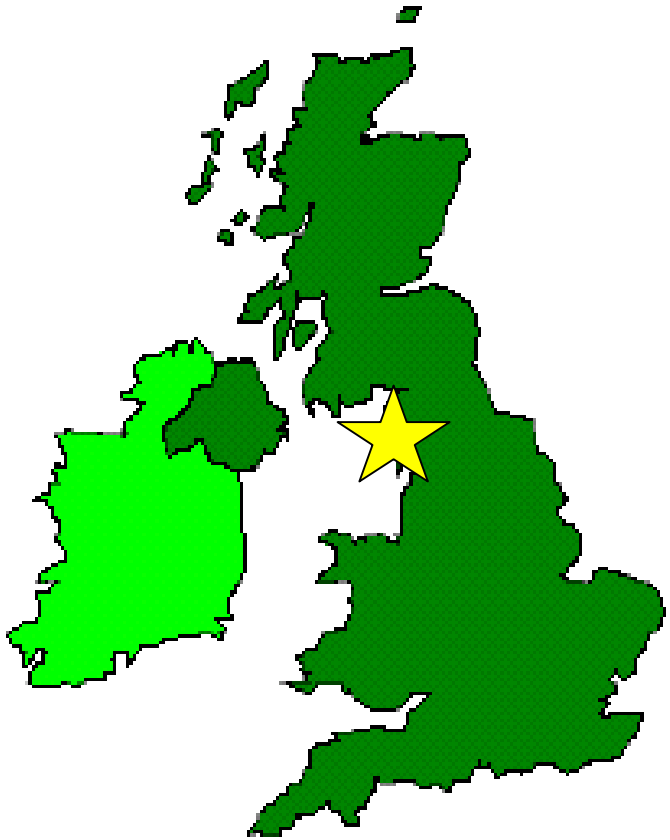
HISTORY - IMPLICATIONS

- Large number of different reactor types of different ages with different spent fuel and radioactive waste requirements
- Sites, particularly Sellafield, with large range of spent fuel and radioactive waste management facilities – some designed in late 1940s and still operating, and some of the very latest designs
- Programme of shut down of the Magnox fleet of reactors with end of associated reprocessing operations around 2012
- Large amount of spent fuel and radioactive waste in various forms and facilities
- Disposal facilities for LLW and passive safe storage approach to ILW & HLW

UK SPENT FUEL MANAGEMENT FACILITIES

Article 32.2(i)
Annex L1

UK SPENT FUEL MANAGEMENT FACILITIES



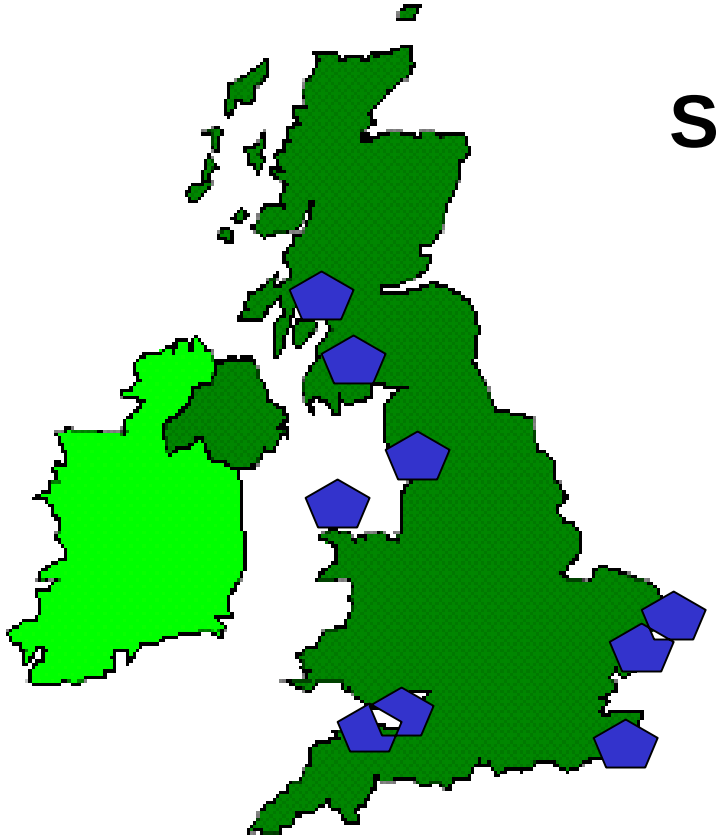
REPROCESSING

SELLAFIELD

Magnox

THORP

UK SPENT FUEL MANAGEMENT FACILITIES

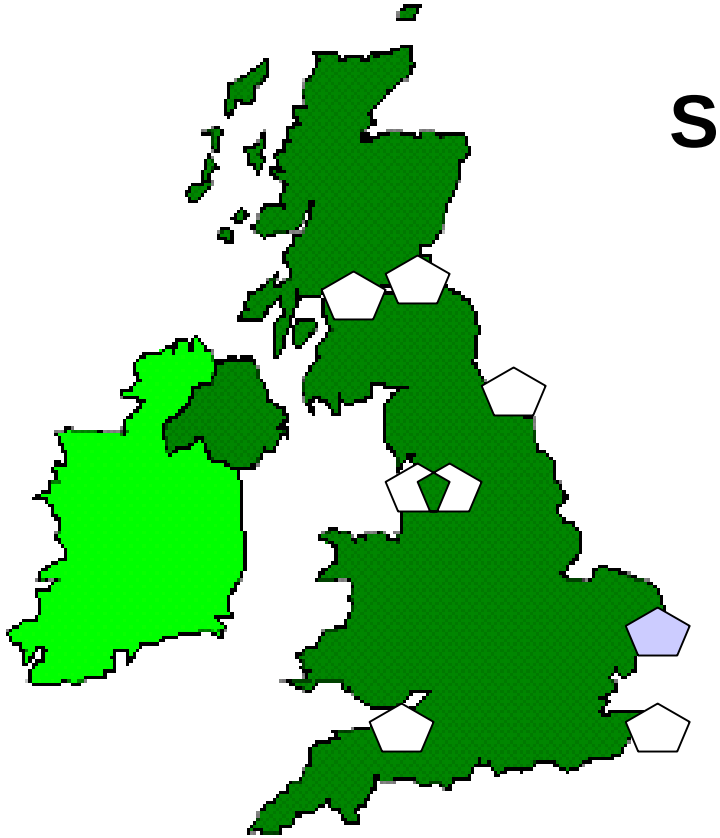


Spent Fuel Storage

Magnox Stations

- Wet storage for at least 90 days
- Except Wylfa dry storage

UK SPENT FUEL MANAGEMENT FACILITIES



Spent Fuel Storage

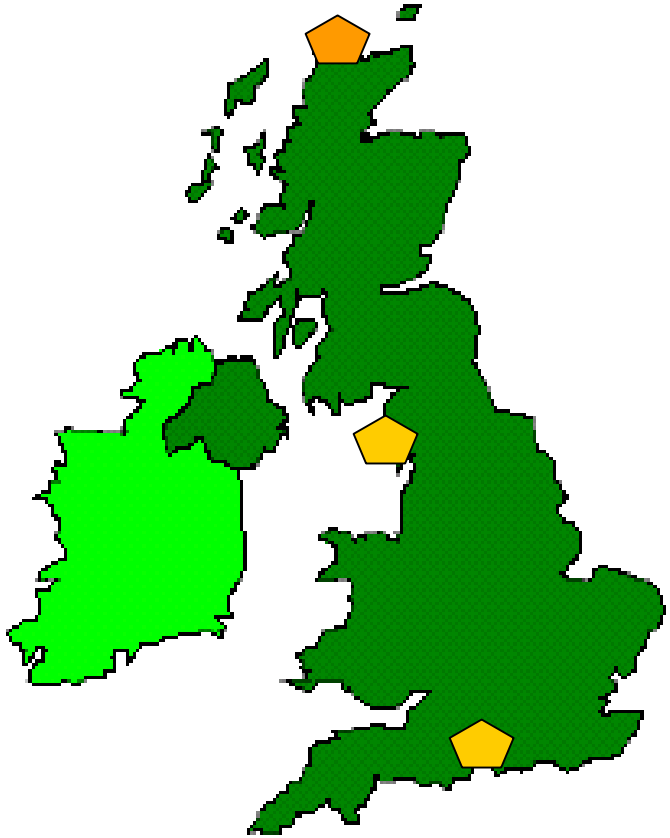
AGR Stations

- Wet storage for at least 100 days.

PWR Station

- Indefinite storage in ponds.

UK SPENT FUEL MANAGEMENT FACILITIES



Spent Fuel Storage

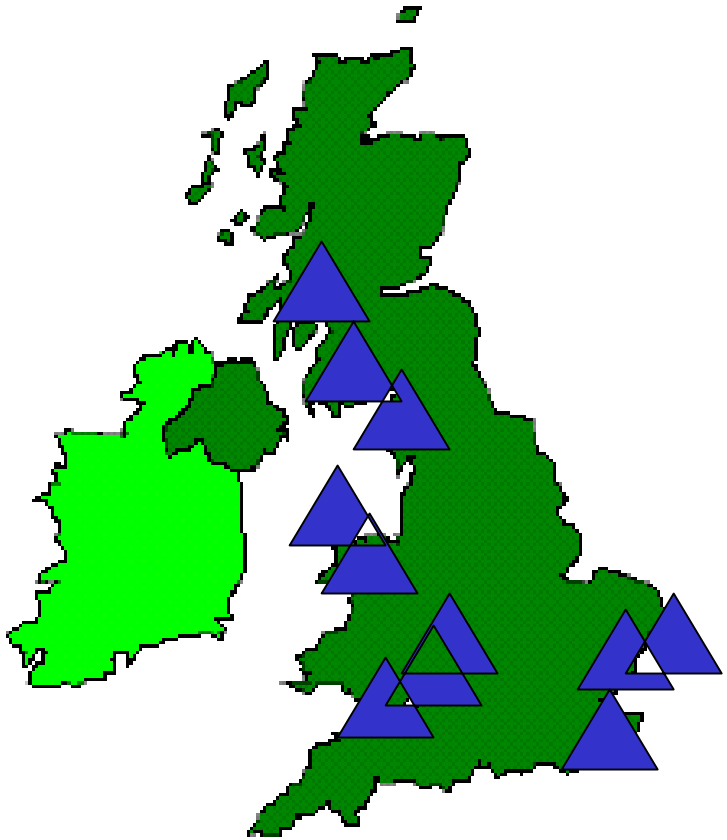
Other sites

UK SPENT FUEL MANAGEMENT FACILITIES

UK RADIOACTIVE WASTE MANAGEMENT FACILITIES

Article 32.2(iii)
Annex L2

UK RADIOACTIVE WASTE MANAGEMENT FACILITIES

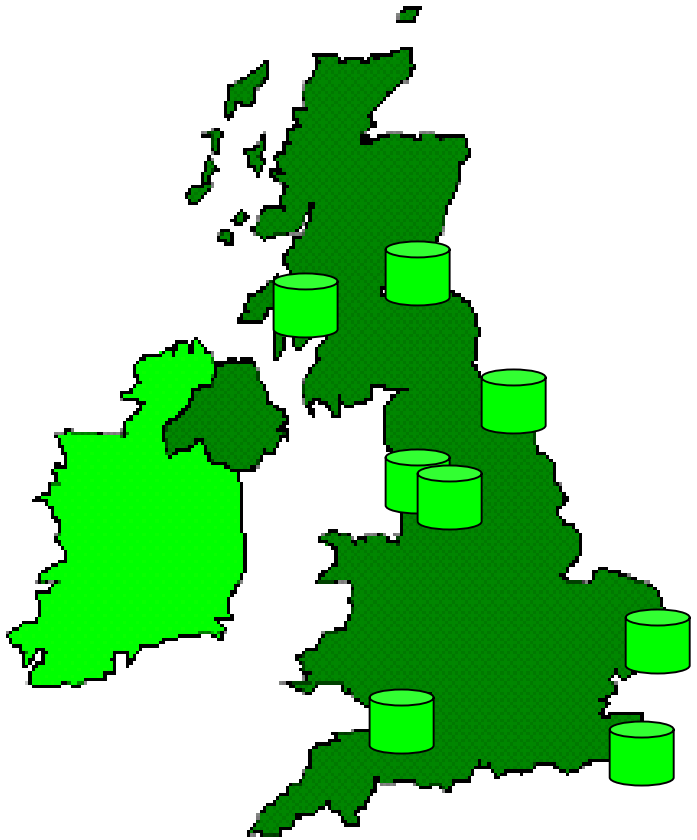


BNFL

Magnox Reactor Sites

- Underground vaults
- Above ground vaults
- Reactor voids
- Tanks

UK RADIOACTIVE WASTE MANAGEMENT FACILITIES



British Energy

- **Voids**
- **Wet waste storage tanks**
- **Desiccant storage**
- **Ion exchange resin storage tanks**

TIVE WASTE
T FACILITIES

UKAEA
Restoring our Environment

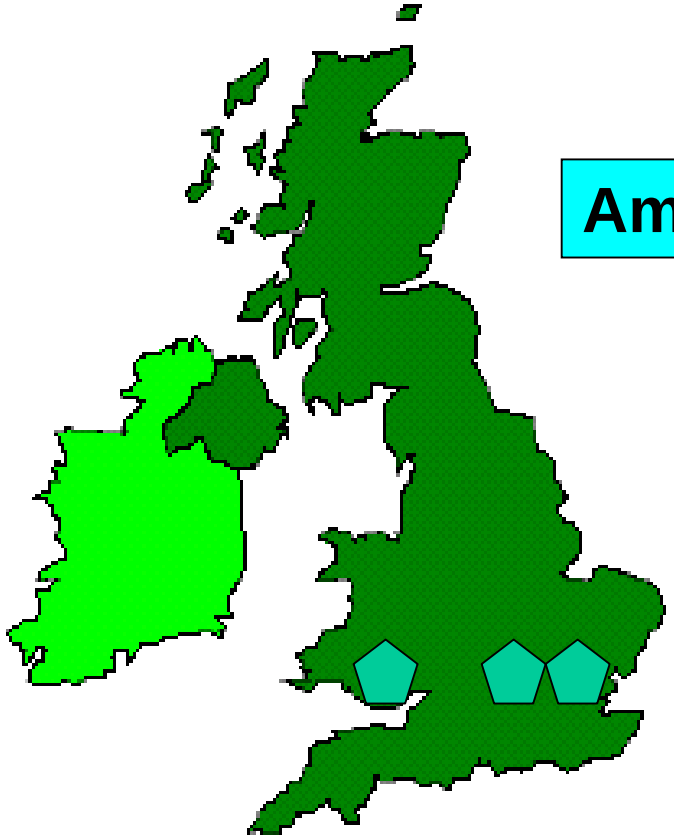
Engineered Stores

Vaults and Silos

ILW liquid waste tanks

Miscellaneous stores

UK RADIOACTIVE WASTE MANAGEMENT FACILITIES



Amersham

Amersham and Cardiff Sites

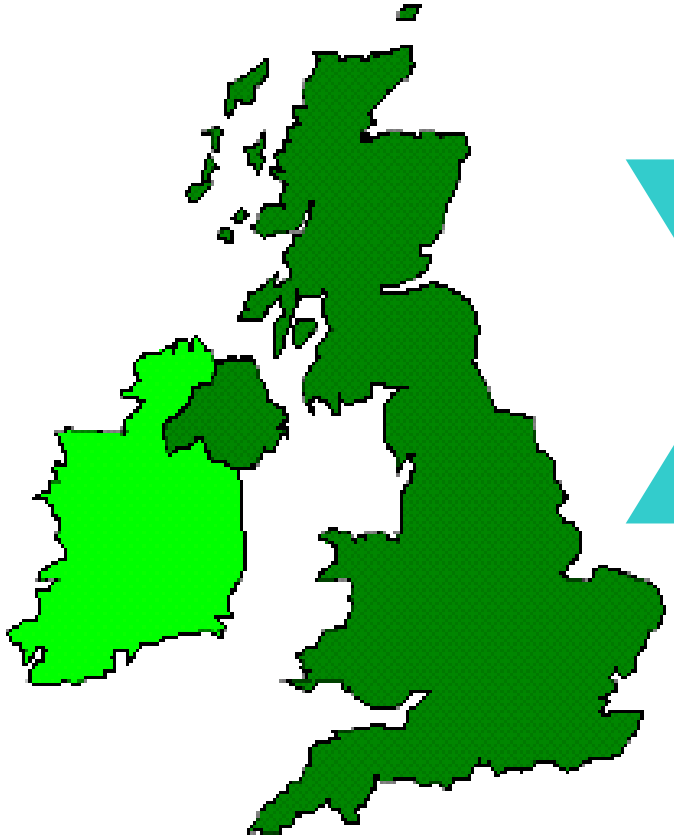
Decay storage in stainless steel drums

Harwell Site

“Sea dump” type drums undergoing sorting and repacking

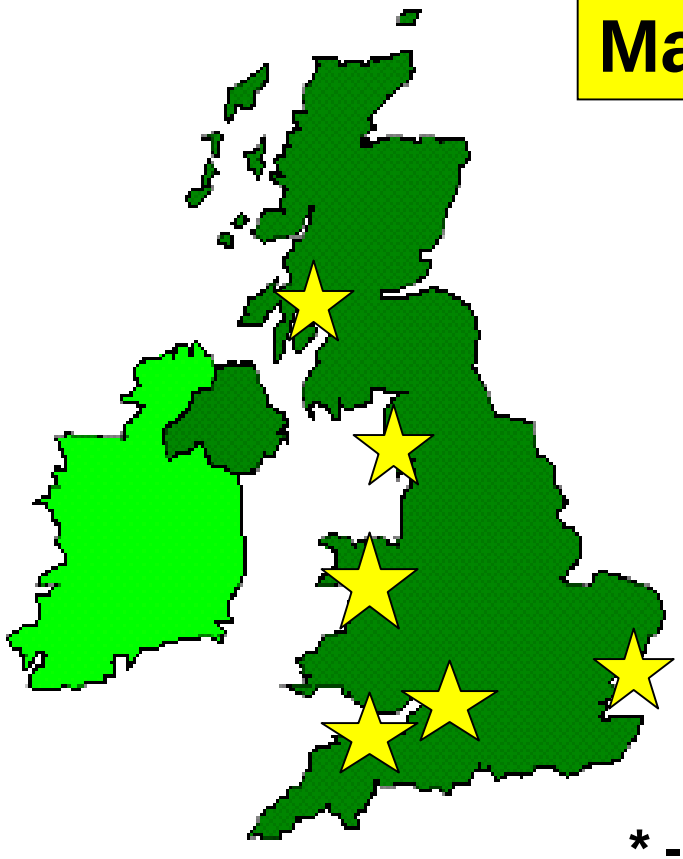

Decay storage in stainless steel drums at Amersham

UK DECOMMISSIONING SITES



Article 32.2(v)
Annex L3

UK DECOMMISSIONING SITES



Magnox Reactors

Berkeley

Trawsfynydd

Hunterston A

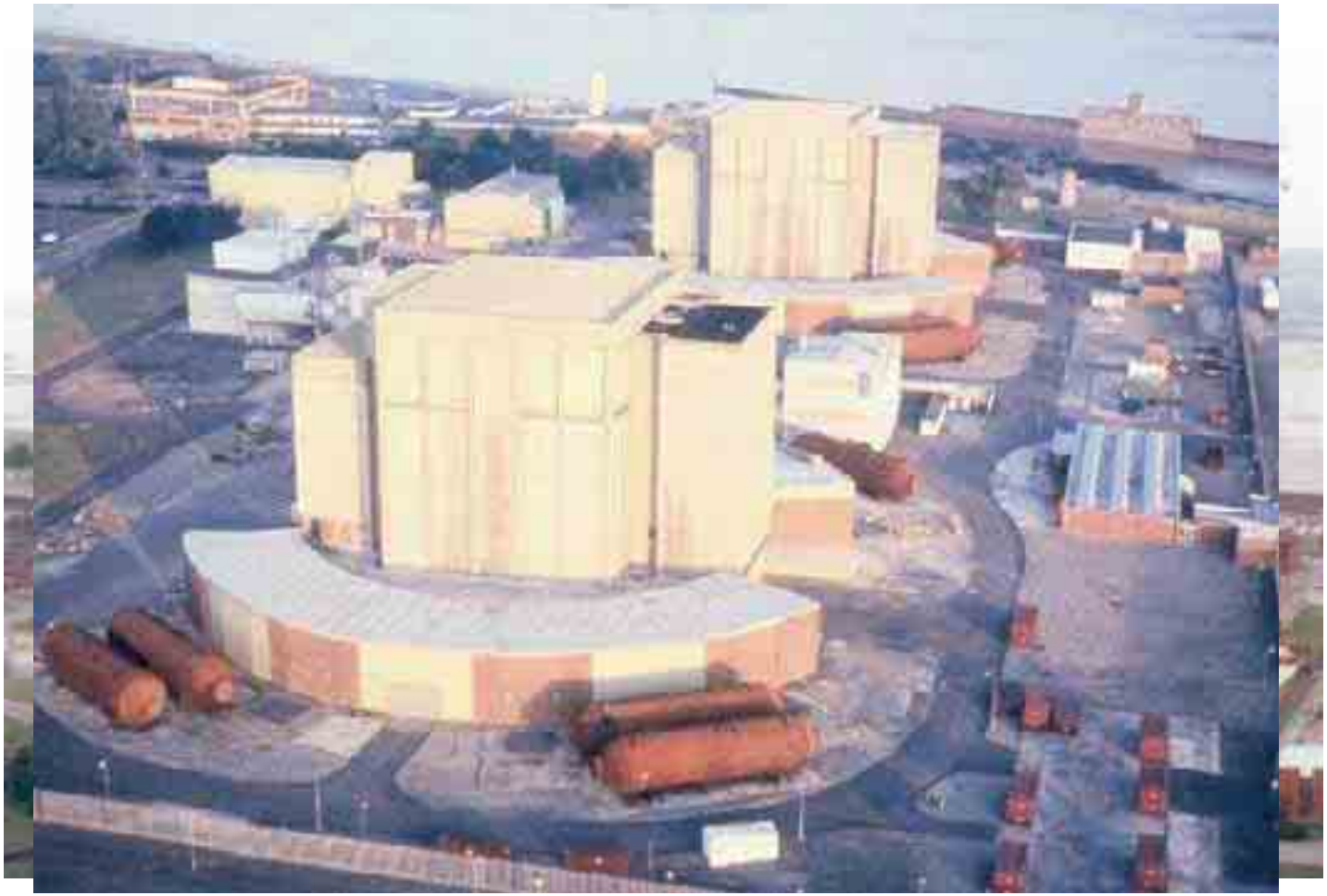
Hinkley Point A

Bradwell

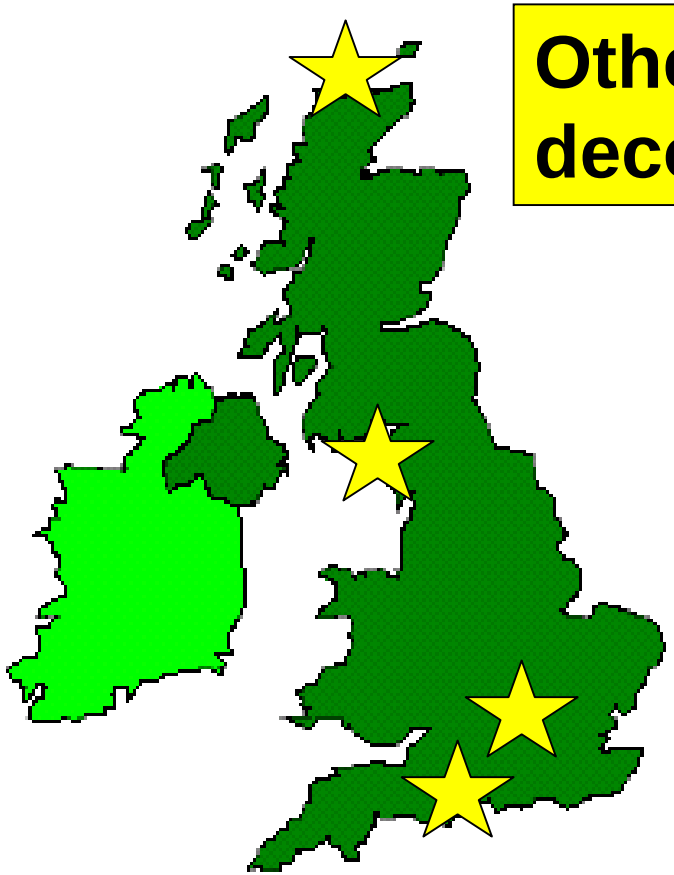
Calder Hall *

*** - Shut down since the production of the UK report**

BERKELEY
DECOMMISSIONING PROGRESS



UK DECOMMISSIONING SITES



Other major decommissioning sites

Dounreay

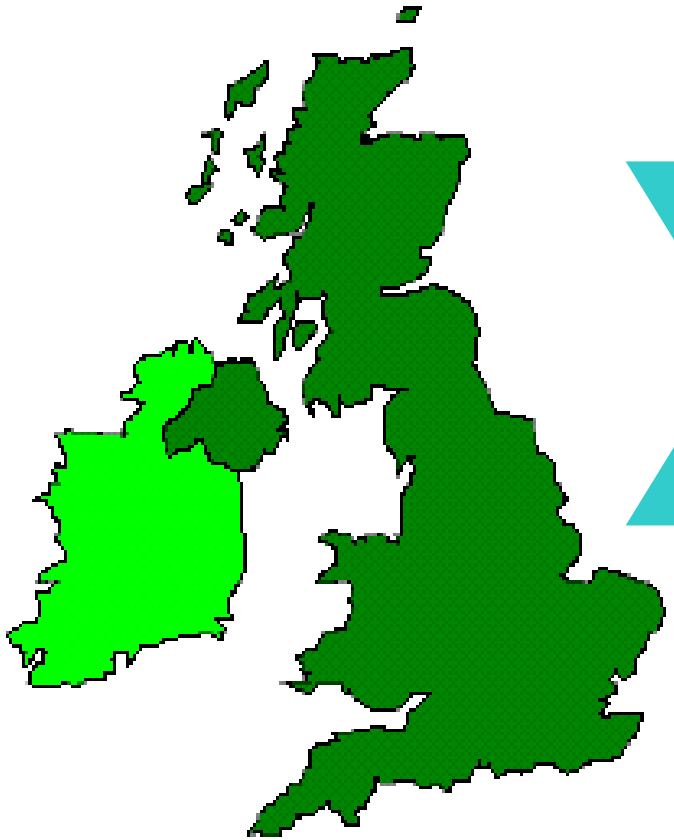
Windscale

Harwell

Winfrith

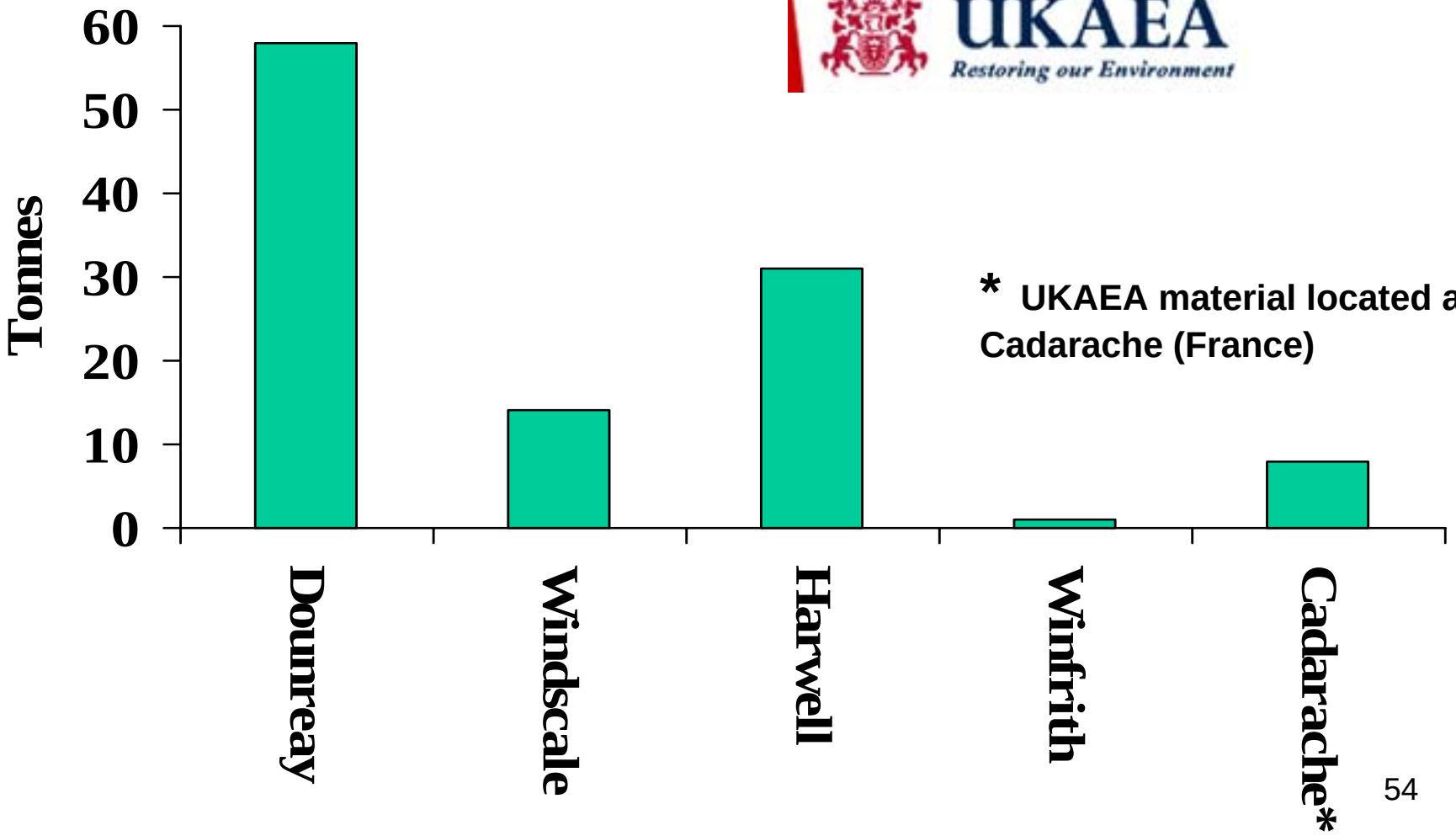
WINDSCALE PILES DECOMMISSIONING PROGRESS

INVENTORY OF SPENT FUEL



Article 32.2(ii)
Annex L4

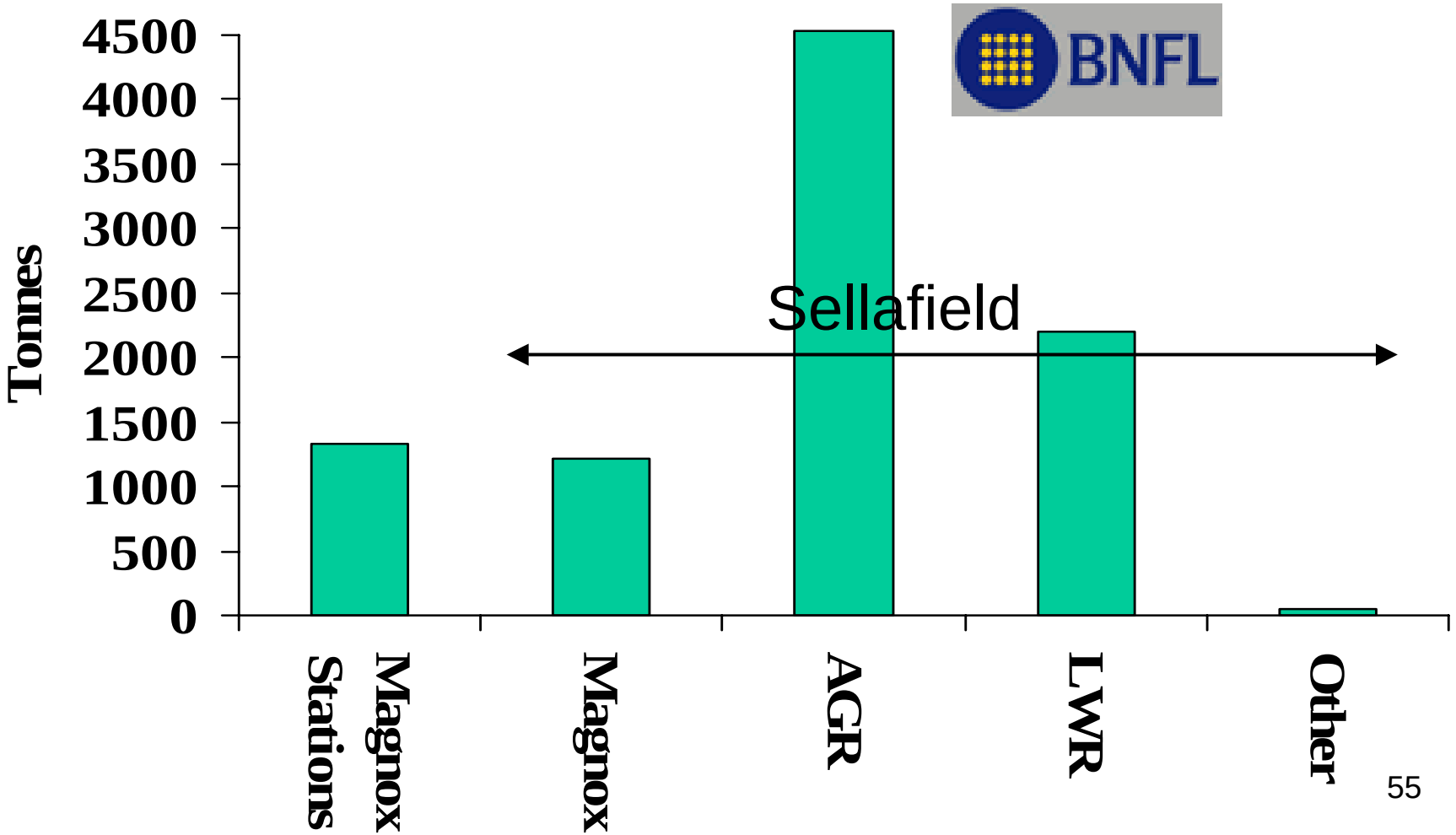
INVENTORY OF SPENT FUEL



UKAEA
Restoring our Environment

* UKAEA material located at Cadarache (France)

INVENTORY OF SPENT FUEL



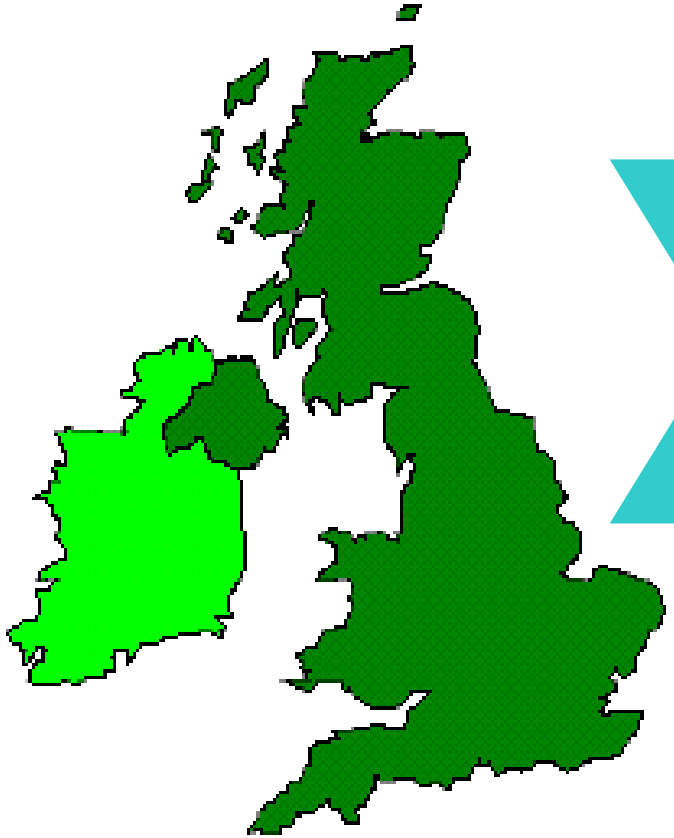
INVENTORY OF SPENT FUEL

British Energy

AGRs – 2450 spent fuel elements at BE sites.

PWR – all fuel discharged since going critical in 1995 held on Sizewell B site.

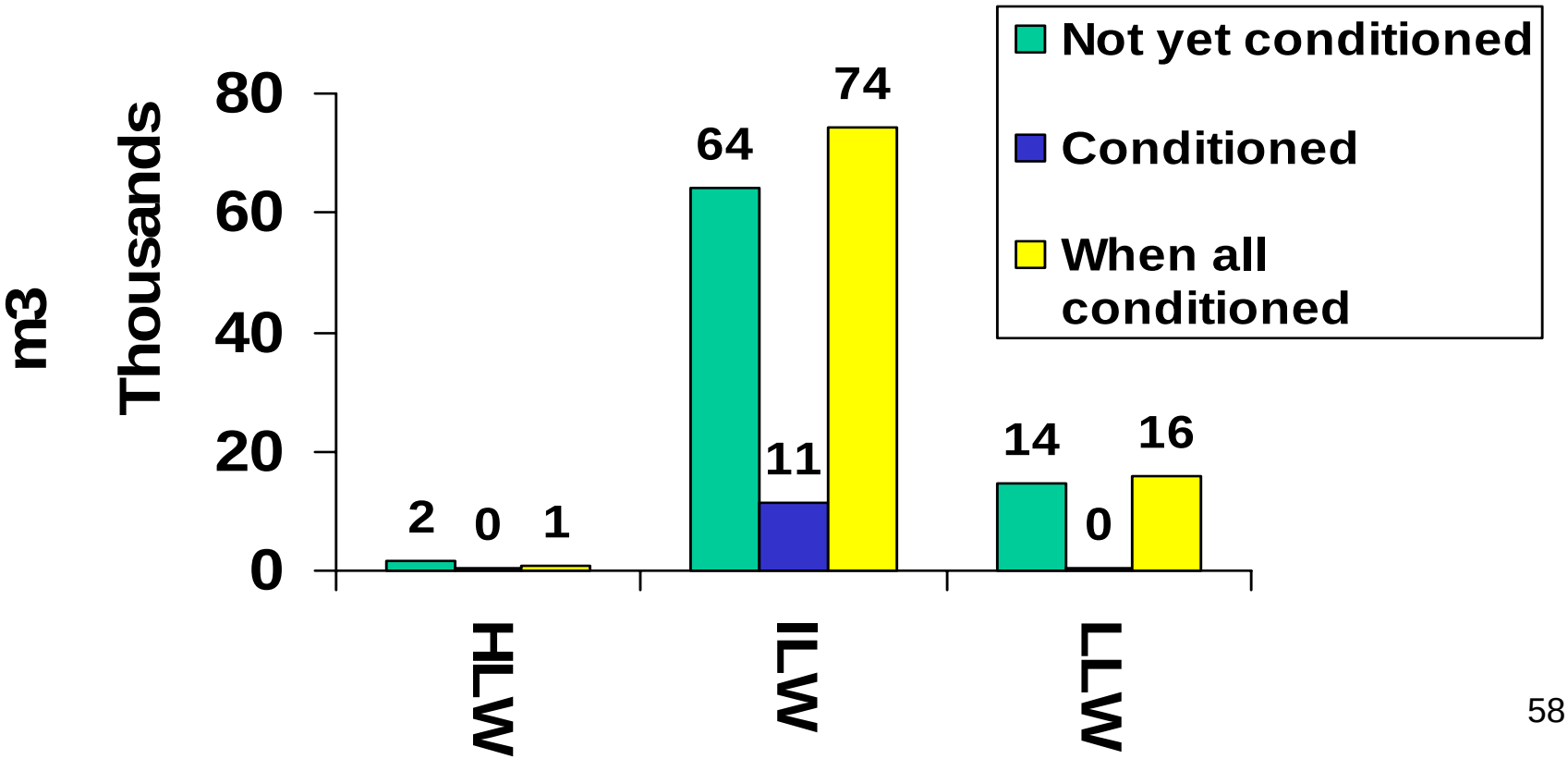
INVENTORY OF RADIOACTIVE WASTE



Article 32.2(iv)
Annex L5

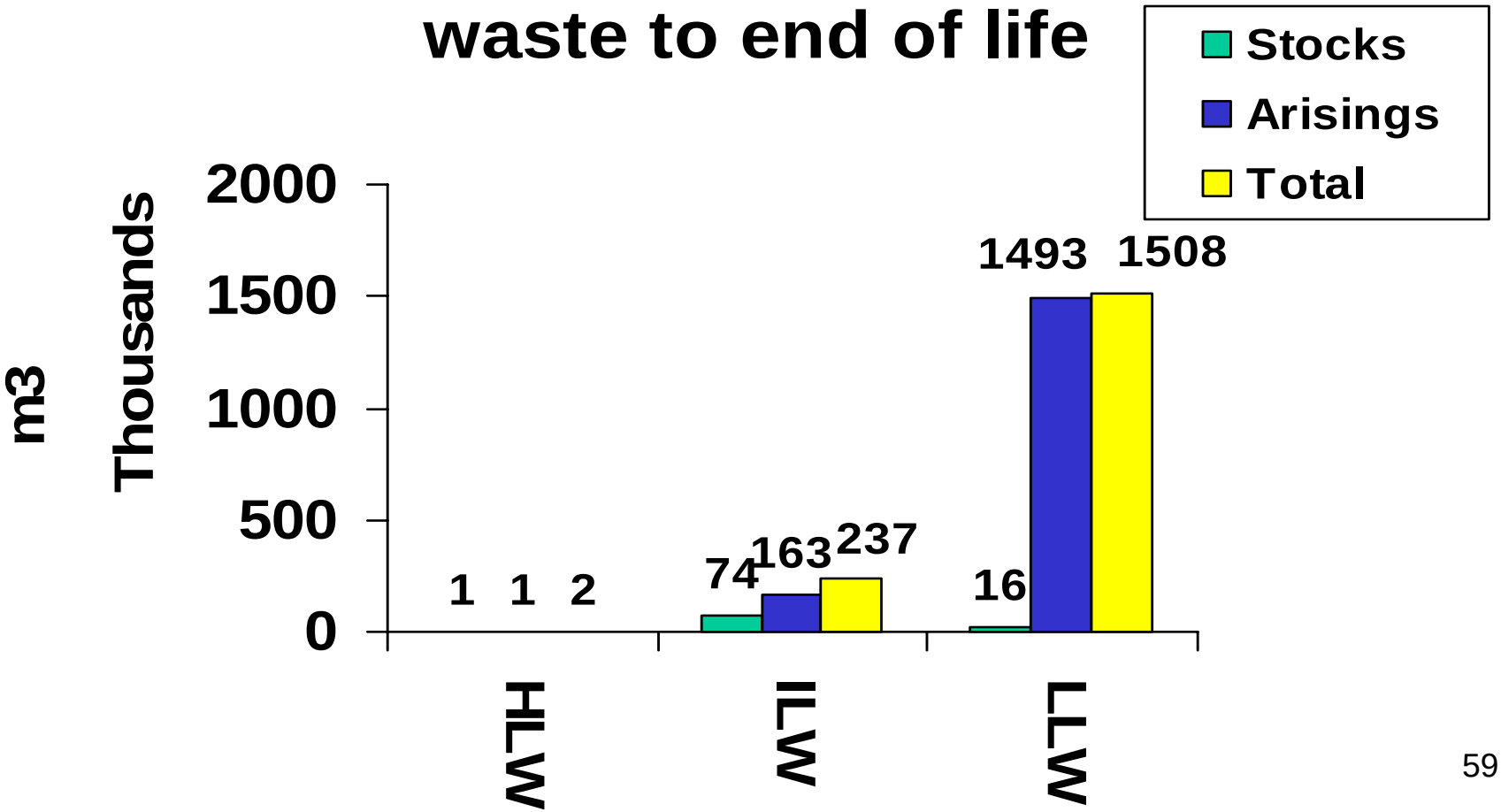
INVENTORY OF RADIOACTIVE WASTE

Radioactive waste from all sources (2001 inventory)



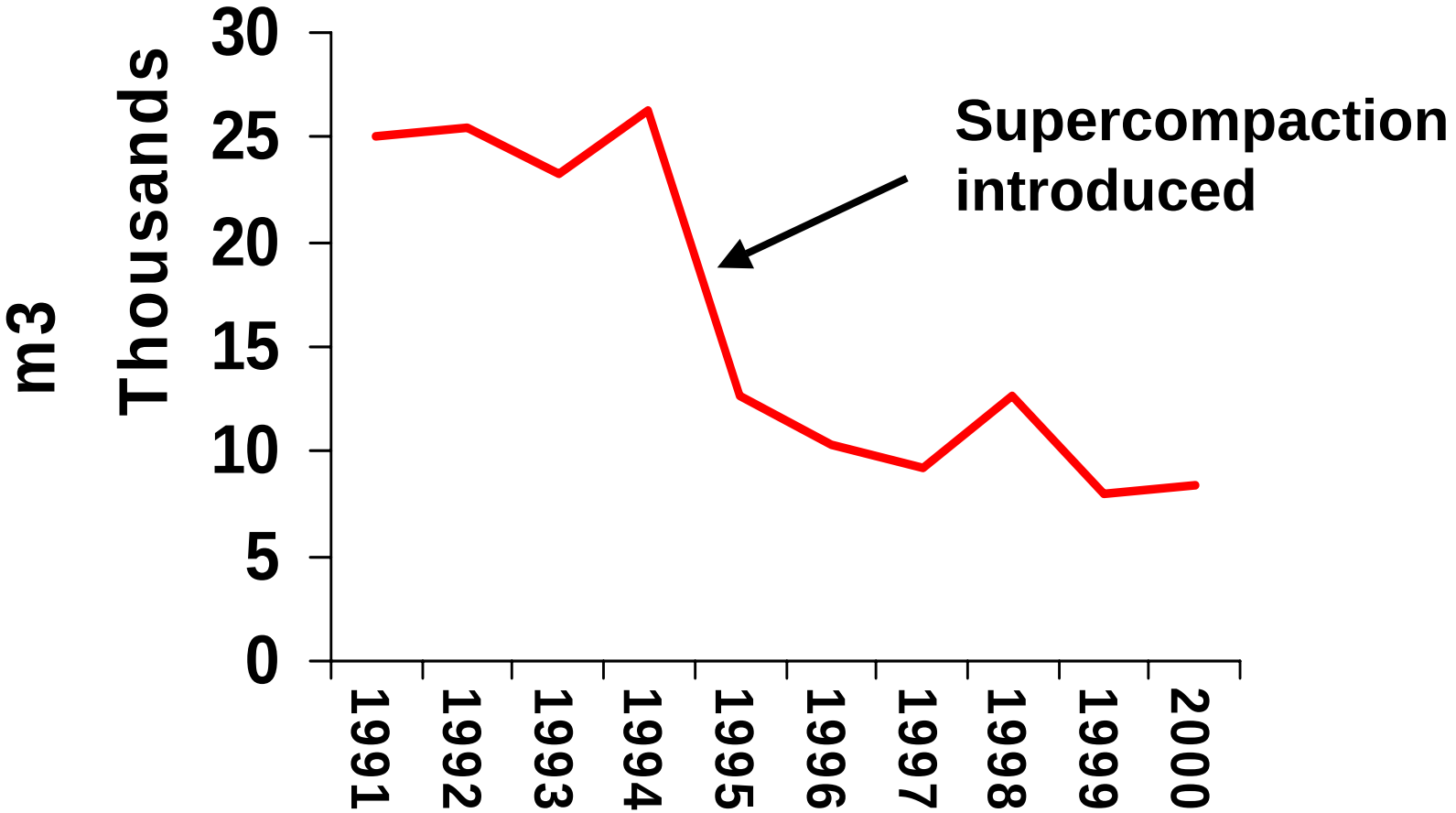
INVENTORY OF RADIOACTIVE WASTE

Expected volumes of conditioned waste to end of life

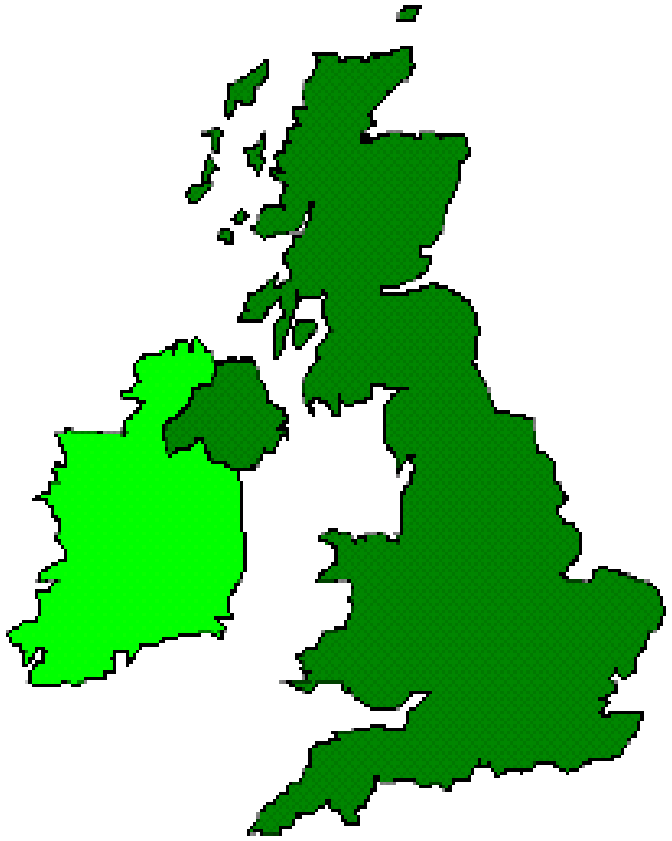


INVENTORY OF RADIOACTIVE WASTE

Annual Disposals of LLW

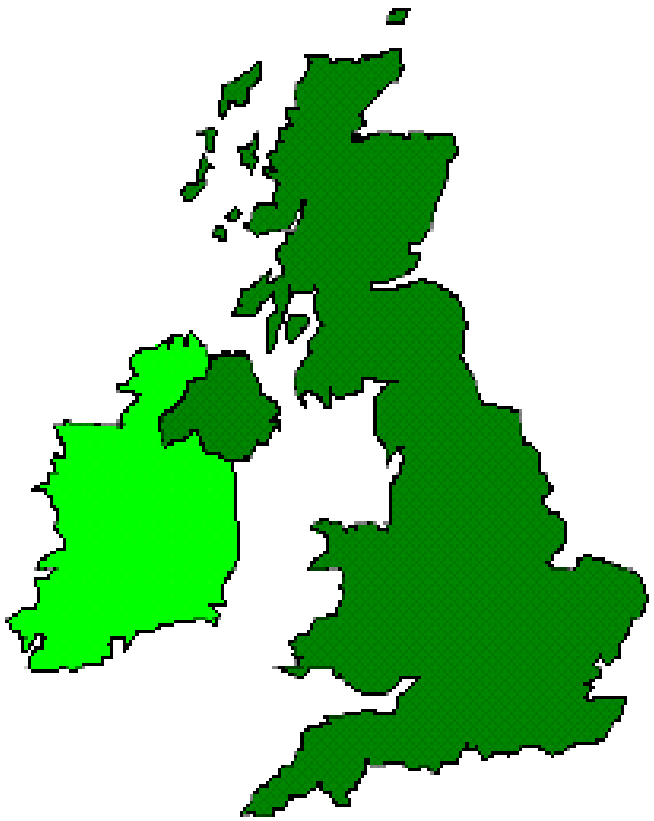


BASIC POLICY – SAFETY & ENVIRONMENT



UK Government's basic policy is to ensure adequate statutory powers and other measures to protect the quality of life and the natural environment from harmful levels of radioactivity.

BASIC POLICY – SAFETY & ENVIRONMENT



- Must meet **LIMITS, and**
- Reduce further in line with:

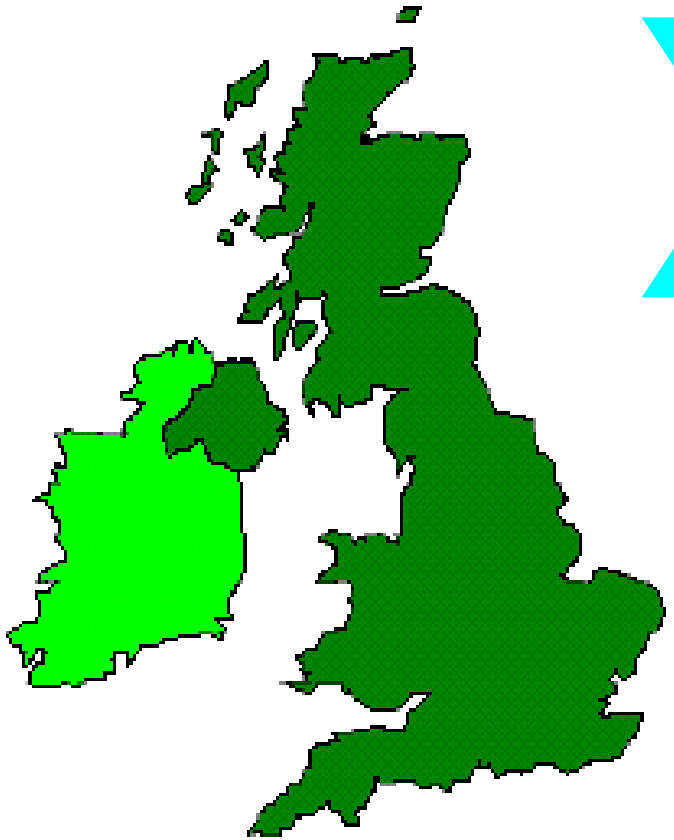
ALARP/BPEO/BPM

(Taking into account all relevant factors)

RADIOACTIVE WASTE MANAGEMENT POLICIES - CATEGORISATION

- **VLLW**
  - **Can be disposed of with ordinary refuse.**
  - **<400kBq(β/γ) in 0.1m^3, <40kBq (β/γ) per item.**
- **LLW**
  - **not exceeding 4GBq/te(α)or 12 GBq/te(β/γ).**
- **ILW**
  - **Greater specific activity than LLW but no need to consider self heating.**
- **HLW**
  - **Need to consider self heating.**

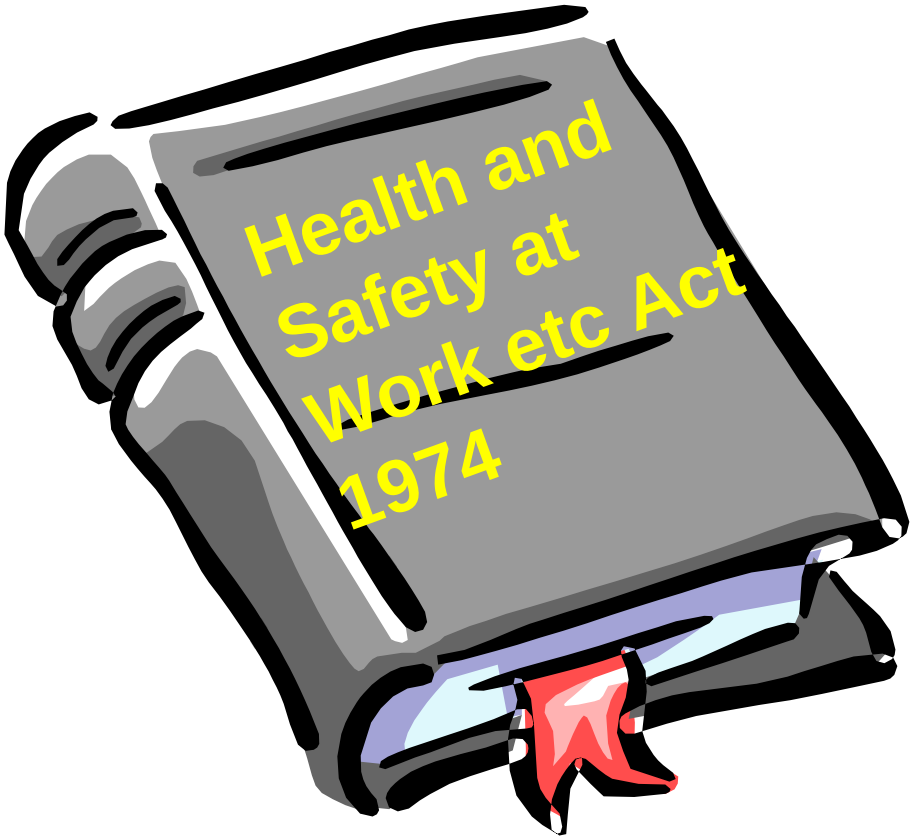
GENERAL SAFETY PROVISIONS



Articles 18 - 26
Sections E & F

- **Legislative & Regulatory System**
- **Responsibility of the Licence Holder**
- **Radiation Protection**
- **Radioactive Discharges**

LEGISLATIVE FRAMEWORK (SAFETY)



Established HSE.

Duty to keep the risks arising from work activities as low as reasonably practicable.

LEGISLATIVE FRAMEWORK (SAFETY)

Licensing regime for nuclear sites.

No site may be used for the purpose of installing or operating a nuclear installation unless a licence has been granted by the HSE.

LEGISLATIVE FRAMEWORK (SAFETY)

Regulations for the protection of the general public and workers against the dangers of ionising radiation.

LEGISLATIVE FRAMEWORK (ENVIRONMENT)

Established EA and SEPA.

LEGISLATIVE FRAMEWORK (ENVIRONMENT)

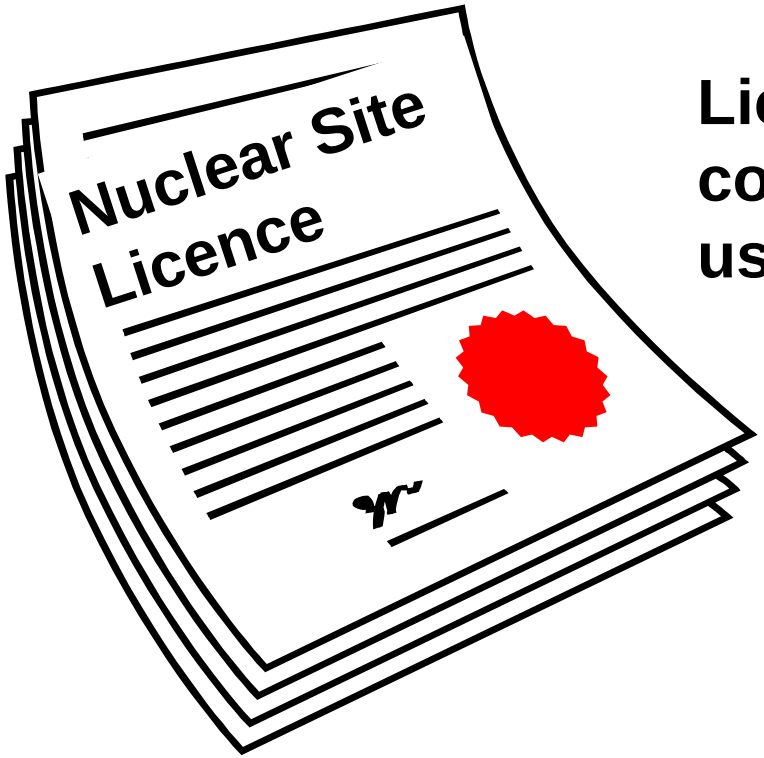
Requires prior authorisation to dispose of / discharge radioactive waste.

NUCLEAR SITE LICENSING

Spent fuel and radioactive waste management installations for which a nuclear site licence is required are those for:

- **The processing of irradiated nuclear fuel;**
- **The storage of irradiated nuclear fuel, or bulk quantities of any other radioactive matter.**

NUCLEAR SITE LICENSING



Licences issued to the corporate body that is the user of the site.

Licensing system applies throughout the lifetime of a nuclear site including installation, commissioning, operation and decommissioning.

NUCLEAR SITE LICENSING

Regulatory control exercised through 36 standard conditions attached to the licence.

Licence conditions are goal setting and cover all the various types of nuclear facilities.

AUTHORISATION OF DISPOSALS / DISCHARGES

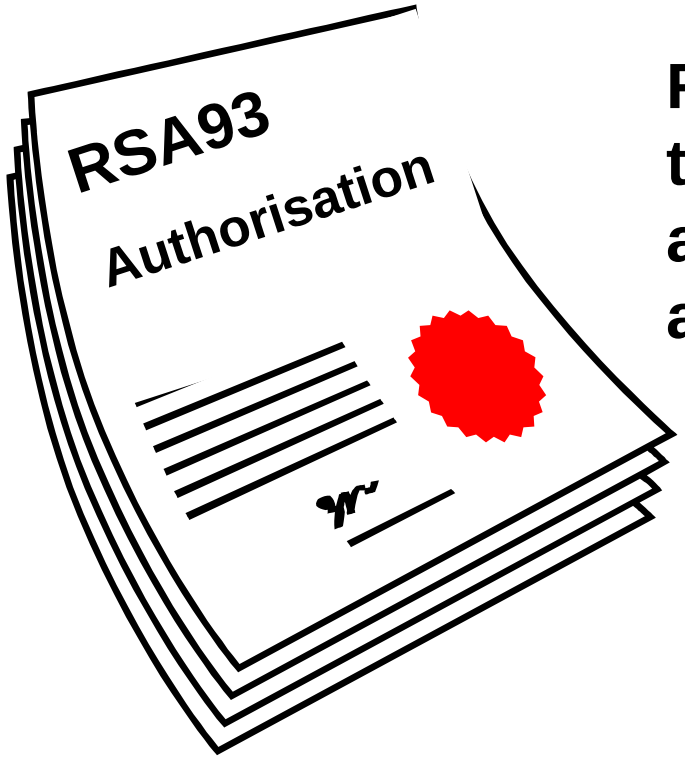
No person may dispose of radioactive waste except in accordance with an authorisation under RSA93 unless the waste is excluded by the Act or by an Exemption Order.

AUTHORISATION OF DISPOSALS / DISCHARGES

Authorisations are not time limited, but are generally reviewed and re-issued periodically.

The issue or review of authorisations for licensed nuclear sites is subject to extensive public consultation.

AUTHORISATION OF DISPOSALS / DISCHARGES



Regulatory control exercised through limits and conditions attached to the authorisations.

Authorisations stress the requirement to use BPM to limit discharges.

ENFORCEMENT

Failure to have a Licence or Authorisation as appropriate;

or

failure to comply with the conditions attached to such a Licence or Authorisation,

is a criminal offence.

ENFORCEMENT POWERS

Regulators have legal powers:

of entry;

of investigation and collection of evidence;

to require improvement;

to prohibit activities;

to prosecute.

ENFORCEMENT POWERS

NII has specific powers under Licence Conditions:

- **Consents**
- **Approval**
- **Direction**
- **Notification**
- **Agreement**
- **Specification**

REGULATORY BODIES

Environment

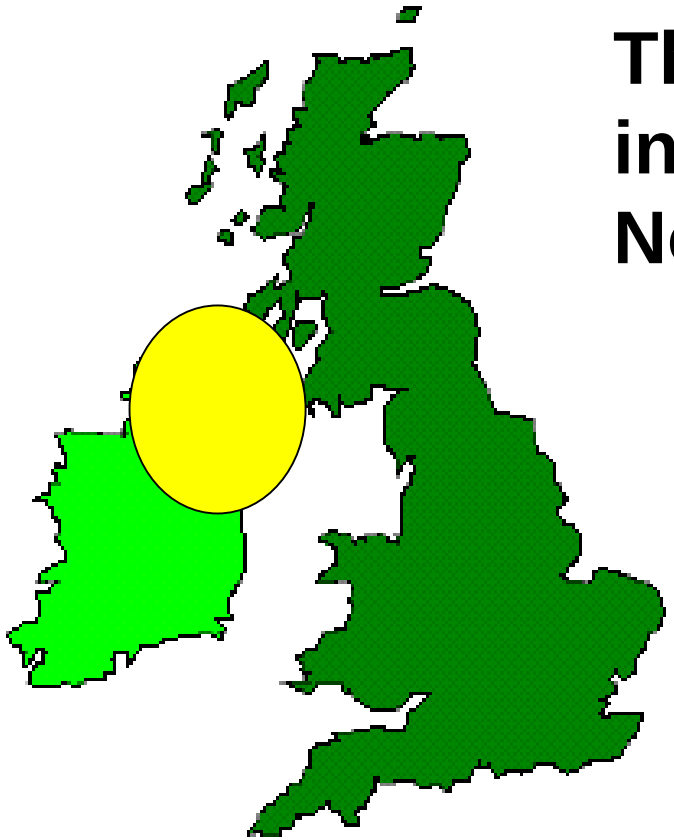
SEPA
Scottish Environment Protection Agency

ENVIRONMENT AGENCY

Safety

HSE
Health & Safety Executive

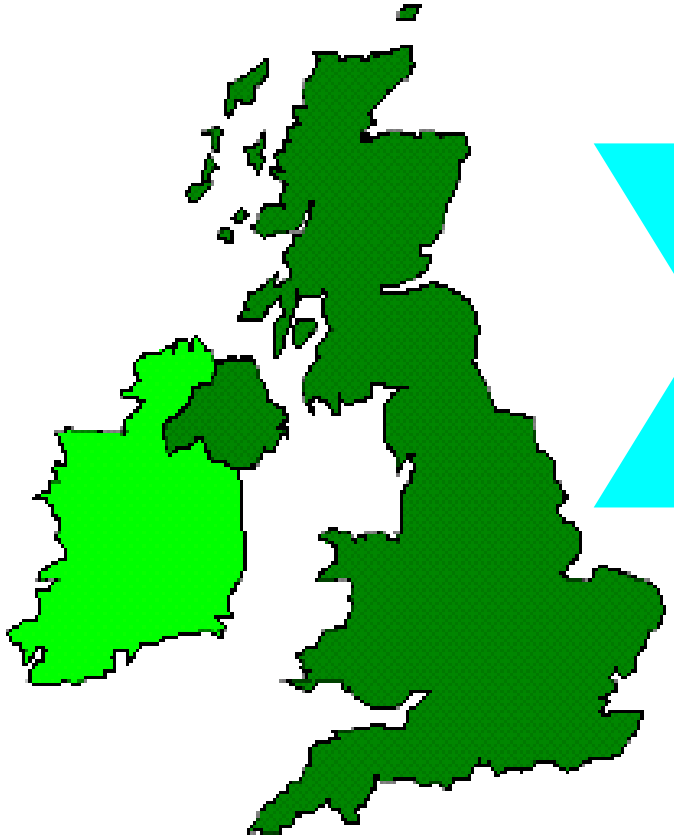
NORTHERN IRELAND REGULATORY SYSTEM



There are no nuclear installations in Northern Ireland.

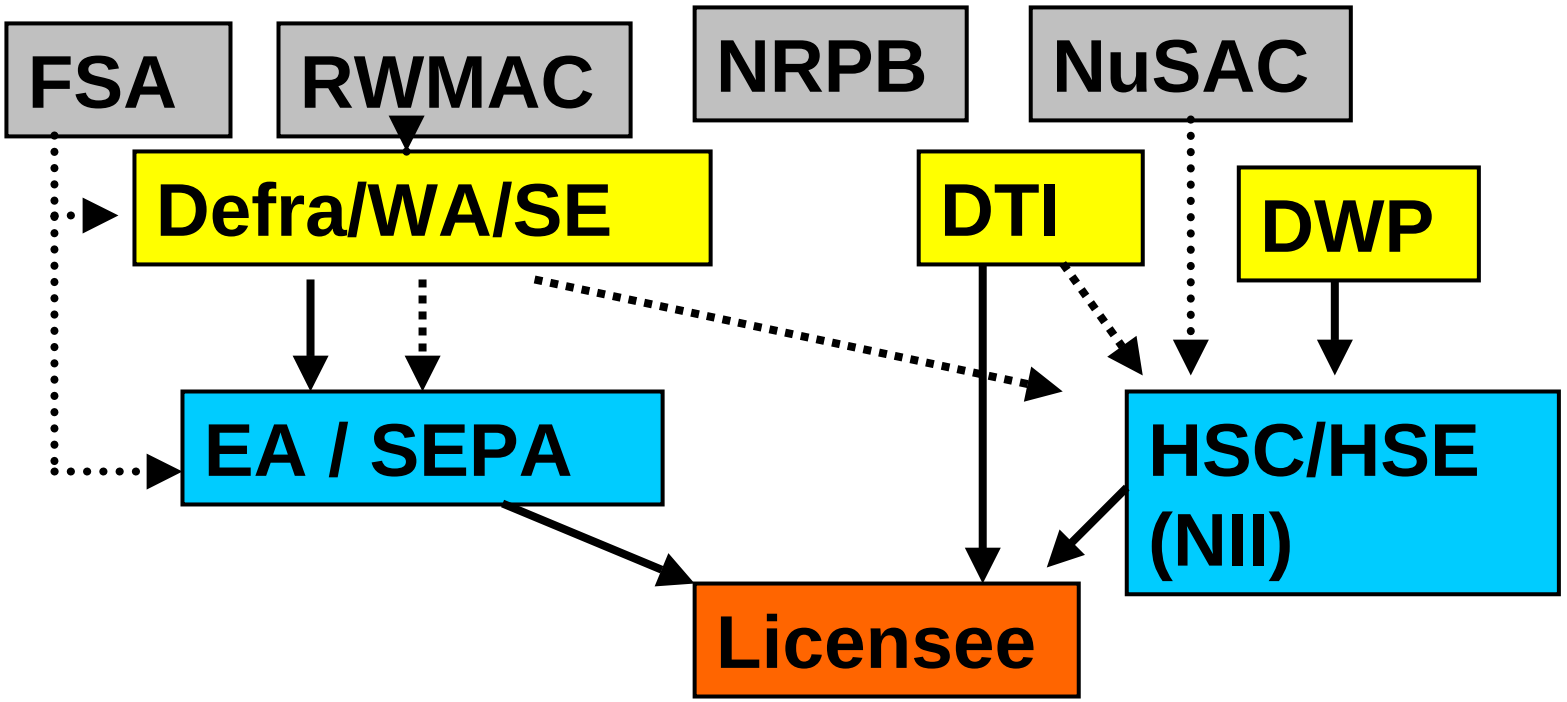
Northern Ireland has its own regulatory system and bodies that parallel those in the rest of the UK.

RESPONSIBILITIES



Article 19.2(iv)
Section E

RESPONSIBILITIES (indicative)



RADIATION PROTECTION

Article 24.1
Section F

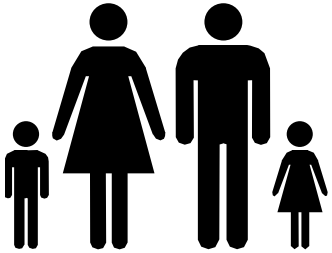
RADIATION PROTECTION

Dose Limits (IRRs regulation 11)

Adult Worker –
20mSv/y

Trainees <18 years
6mSv/y

Woman of reproductive capacity
13mSv/ 3months



Others (Public)
1mSv/y

RADIATION PROTECTION

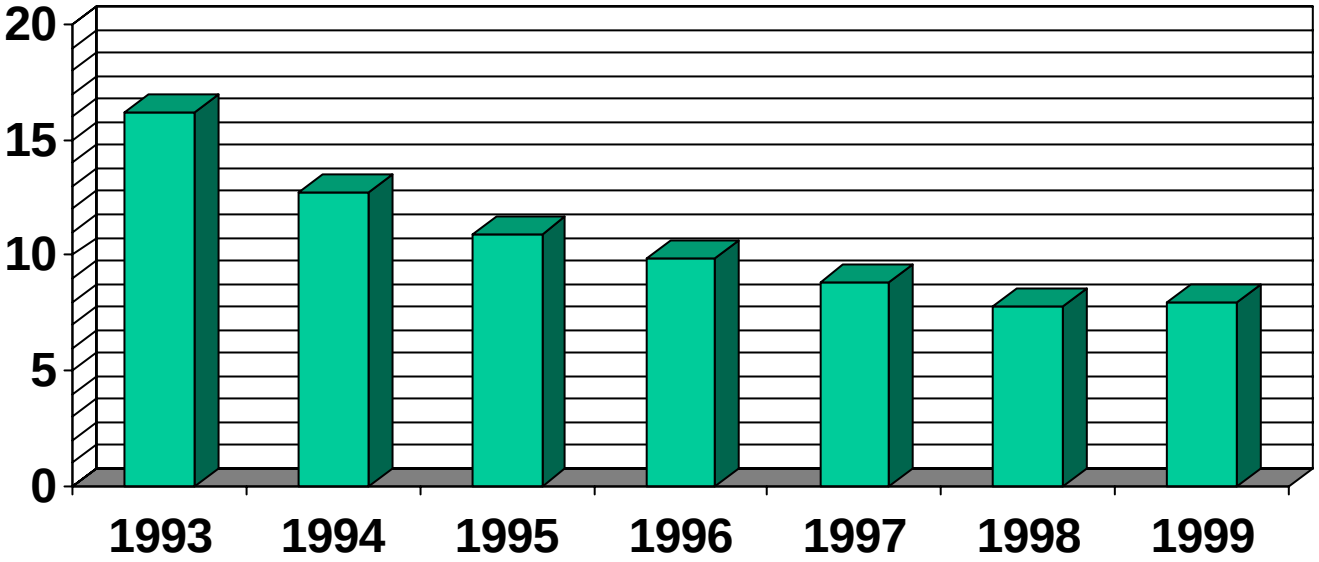
UK safety legislation uses ALARP (As Low As is Reasonably Practicable)

– equivalent to ALARA

Risk-reducing measures should be weighed against the associated costs (in time, trouble and money). The operator must take the measures unless the costs are clearly excessive compared with the benefit of the risk reduction (grossly disproportionate).

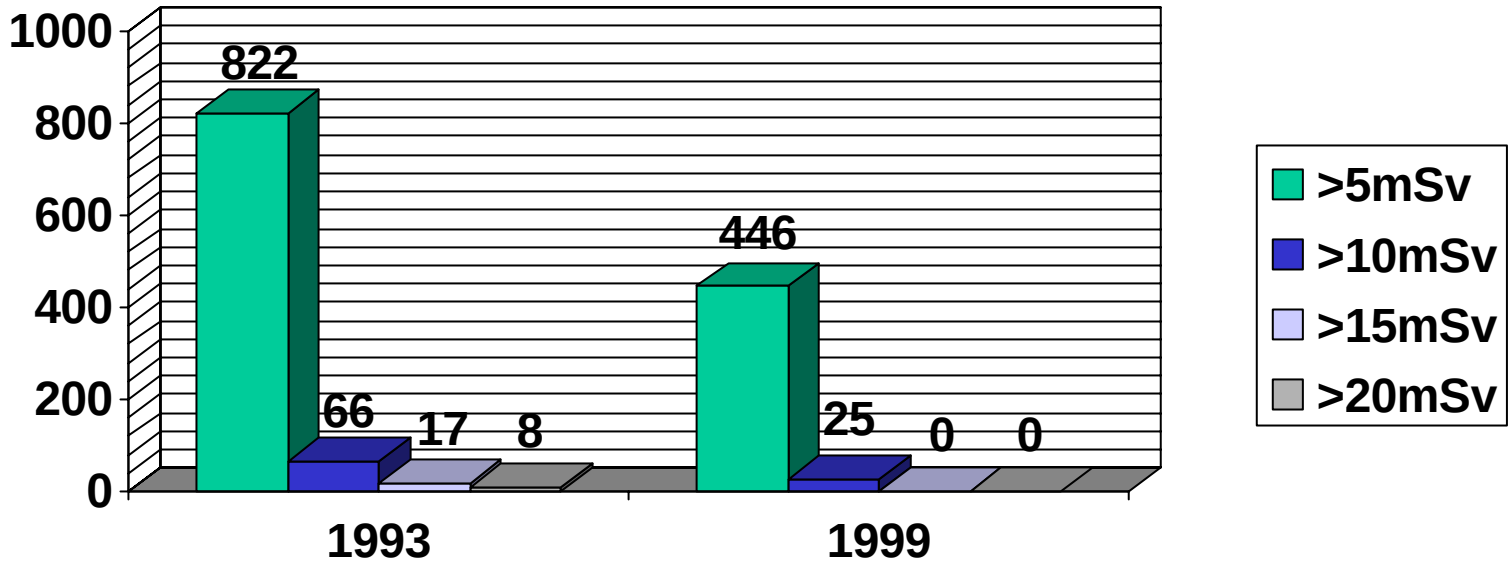
RADIATION PROTECTION

Collective Doses for workers in nuclear installations (Man.Sv)



RADIATION PROTECTION

Individual Doses for workers in nuclear installations (Man.Sv)

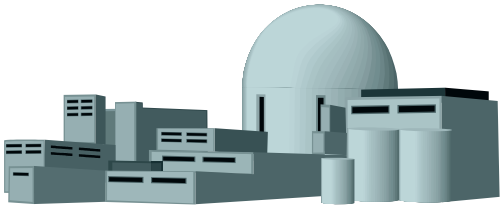


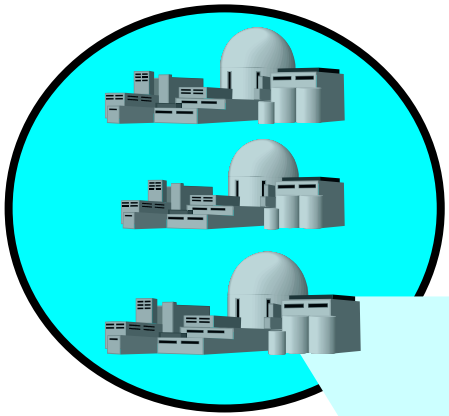
RADIOACTIVE DISCHARGES

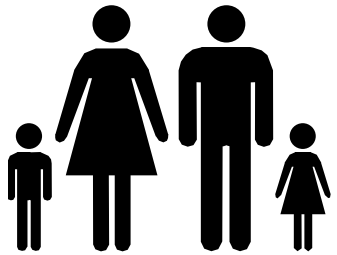
Article 24.2
Section F

RADIOACTIVE DISCHARGES

Constraints and Limits







Source constraint for individual facility

0.3mSv/y

Site constraint

0.5mSv/y

Article 24
Section F

Dose limit from all man-made sources

1mSv/y

RADIOACTIVE DISCHARGES

UK environment legislation uses

BPM (Best Practical Means)

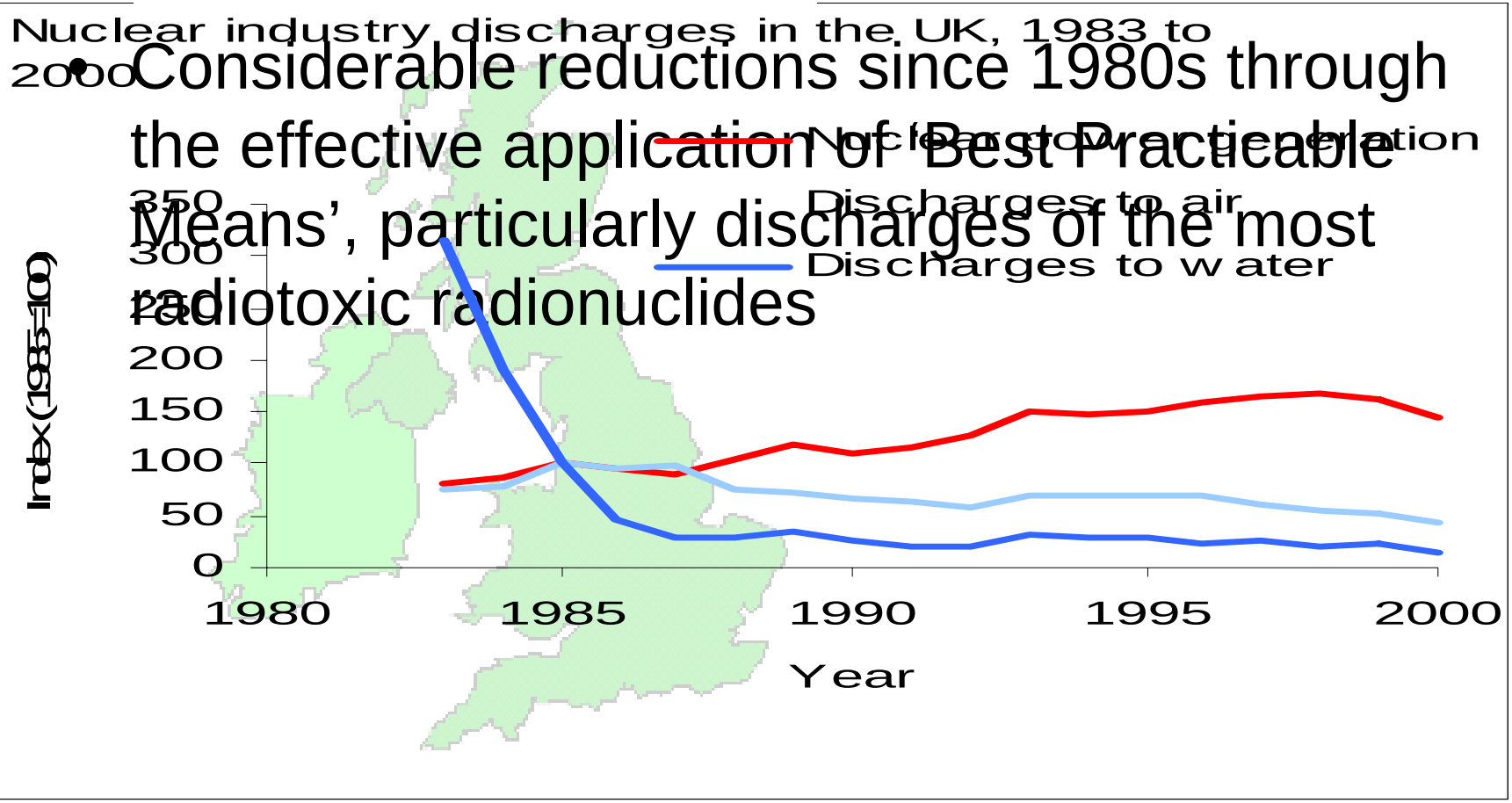
and BPEO (Best Practicable Environmental Option)

– equivalent to ALARA

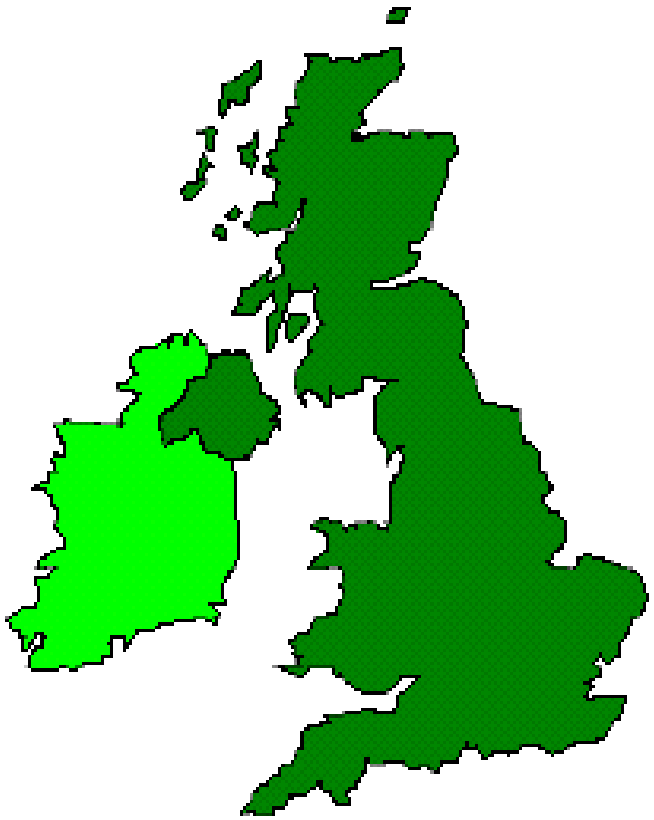
Discharge authorisations require the use of **BPM (Best Practicable means)** to minimise the radiological effects on the environment and on members of the public;

RADIOACTIVE DISCHARGES

- Considerable reductions since 1980s through the effective application of 'Best Practicable Means', particularly discharges of the most radiotoxic radionuclides



SAFETY OF SPENT FUEL MANAGEMENT AND REPROCESSING



Articles 4 - 10
Section G

- **Policies**
- **Practices**
- **Control of Risks**

SPENT FUEL MANAGEMENT POLICY

The decision whether to reprocess or to seek alternative options is a matter for the owners of the spent fuel, subject to meeting regulatory requirements.

Spent fuel should not be categorised as waste, while the option of reprocessing remains open and a future use for the fuel can be foreseen.

SPENT FUEL MANAGEMENT PRACTICES

Magnox fuel is stored wet in ponds but dry at Wylfa, and then reprocessed at Sellafield.

AGR fuel is stored wet in ponds at sites and sent to Sellafield for either reprocessing or long term wet storage

UK PWR fuel is stored wet in the Sizewell B storage pond.

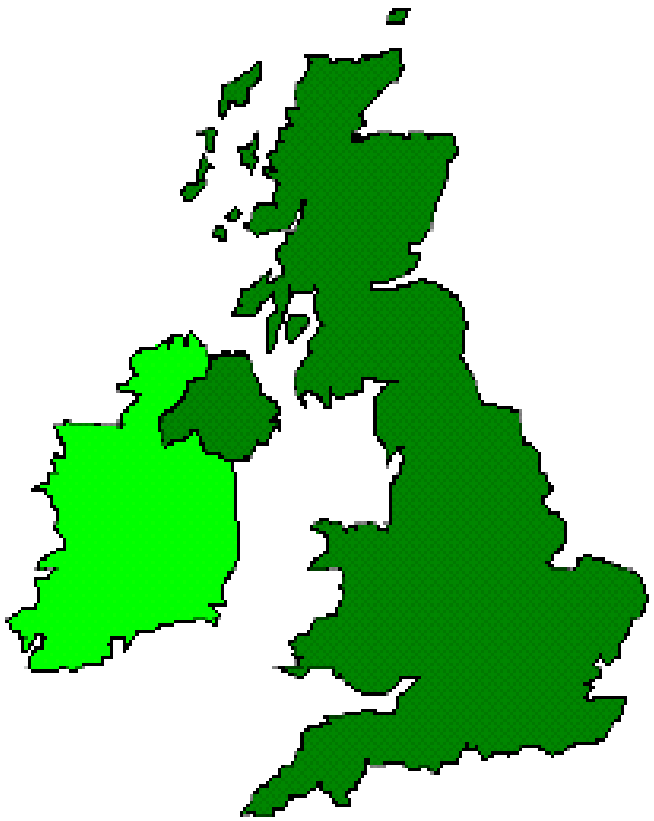
SPENT FUEL MANAGEMENT PRACTICES

LWR fuel from Europe and Japan is stored wet in ponds and reprocessed at Sellafield.

Options for the remaining **UK fast reactor fuel** are under consideration.

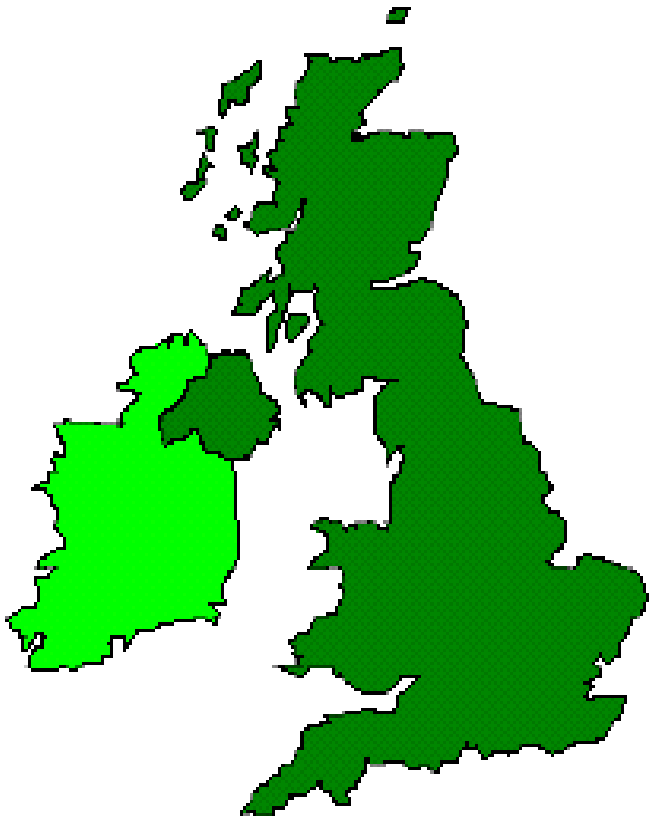
Other spent fuels are stored at UKAEA or BNFL sites.

SPENT FUEL MANAGEMENT CONTROL OF RISKS



- **Licence conditions require licensee to demonstrate adequate control of risks based on safety case – deterministic & probabilistic**
- **Licence conditions require licensee to have and implement adequate management arrangements**
- **Covering all relevant aspects: criticality, cooling, shielding, contamination, containment, process hazards (e.g. hydrogen, exothermic reactions) external hazards, staffing, etc**

SAFETY OF RADIOACTIVE WASTE MANAGEMENT



Articles 11 - 17
Section H

- **Policies**
- **Practices**
- **Control of Risks**

RADIOACTIVE WASTE MANAGEMENT POLICY

UK Government policy on radioactive waste management is based on the same basic principles as apply more generally to environmental policy, and in particular on that of sustainable development.

RADIOACTIVE WASTE MANAGEMENT POLICY

Radioactive wastes should be managed in ways which protect the public, workforce and the environment.

The level of safety, and the resources required to achieve it, should not be inconsistent with those accepted in other spheres of human activity.

RADIOACTIVE WASTE MANAGEMENT POLICY

Radioactive waste should

- **not be unnecessarily created;**
- **be safely managed;**
- **then safely disposed of at appropriate times / ways;**

safeguarding the interests of existing and future generations and the wider environment, and taking due account of costs.

RADIOACTIVE WASTE MANAGEMENT POLICY

Producers and owners of radioactive waste

- **Develop their own waste strategies;**
- **Should not create waste management problems which cannot be resolved;**
- **Where it is practical and cost-effective, should characterise and segregate waste and store it in a passively safe form;**
- **Bear the cost of managing and disposing of the waste.**

RADIOACTIVE WASTE POLICY
- LONG TERM

view

working towards
which has
support and
ally and technically

lived wastes are
and monitored on

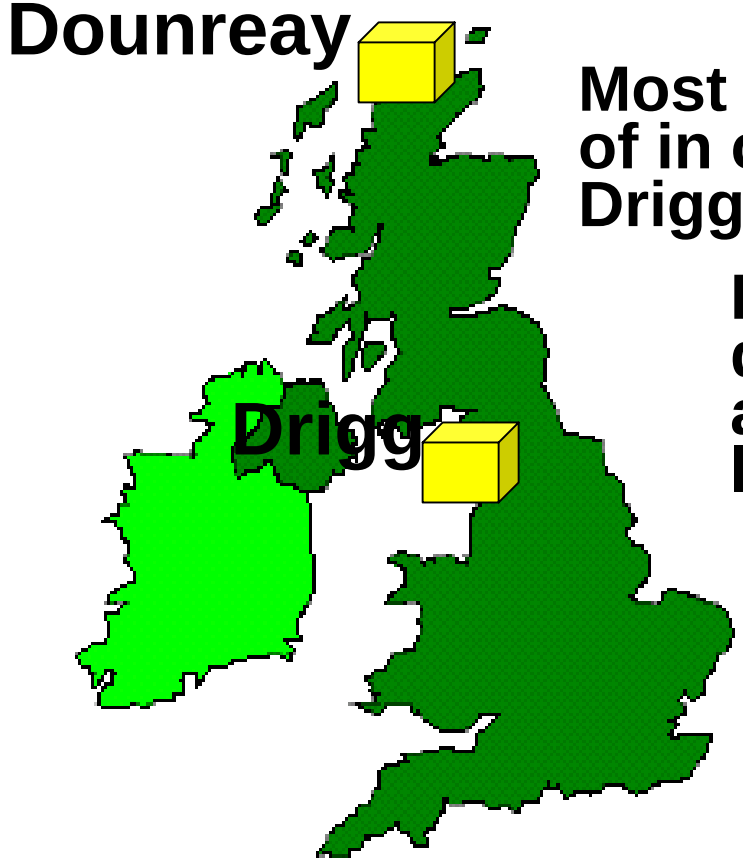
RADIOACTIVE WASTE DISCHARGE / DISPOSAL POLICY

Governed by BPEO and BPM concepts.

Unnecessary introduction of radioactivity into the environment is undesirable.

The progressive reduction of discharges, having regard to the application of BPM, is central to the way in which radioactive discharges are controlled.

RADIOACTIVE WASTE PRACTICE
LOW LEVEL WASTE (LLW)



Most LLW is routinely disposed of in concrete-lined vaults at Drigg.

LLW from Dounreay was disposed of in waste pits at the site. These are no longer used.

~5,600m3 is stored at Dounreay pending a decision on future disposal strategy.

RADIOACTIVE WASTE PRACTICE
INTERMEDIATE LEVEL WASTE (ILW)

- **Currently no final management decision for ILW.**
- **1949 to 1982 - 73,530 tonnes of LLW & ILW disposed of in the North East Atlantic.**
- **ILW currently stored safety pending final strategy decisions**
  - **Current emphasis on conditioning to passive safe form**
  - **A 'Phased Disposal Concept' used as a benchmark for conditioning of waste.**
- **ILW stored safety on a number of sites – majority at Sellafield.**

Cut-away of conditioned ILW waste Container

RADIOACTIVE WASTE PRACTICE
HIGH LEVEL WASTE (HLW)

- **Currently no final management decision for HLW exists**
- **HLW accumulated safely at Sellafield and Dounreay as a liquid in cooled and shielded high integrity tanks.**

RADIOACTIVE WASTE PRACTICE
HIGH LEVEL WASTE (HLW)

- **HLW at Sellafield currently being vitrified**

- **HLW at Dounreay may be reclassified as ILW and cemented**

RADIOACTIVE WASTE MANAGEMENT
CONTROL OF RISKS

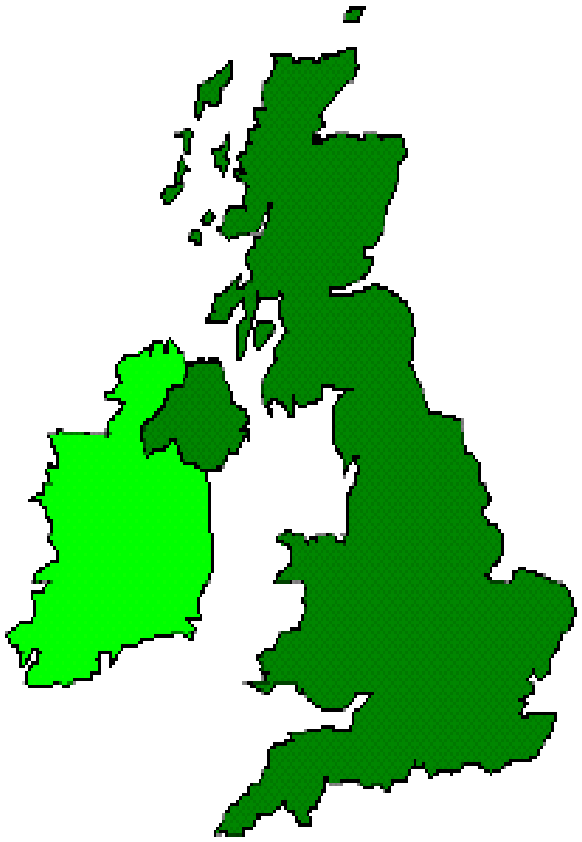
EXACTLY THE SAME AS FOR SPENT FUEL

- **Licence conditions require licensee to demonstrate adequate control of risks & adherence to radwaste management principles, based on safety case**

- **Licence conditions require licensee to have and implement adequate management arrangements**

- **Covering all relevant aspects: criticality, cooling, shielding, contamination, containment, process hazards (e.g. hydrogen, exothermic reactions) external hazards, staffing, etc; minimisation of waste production, segregation, hazard potential minimisation, disposal, etc**

PLANNED ACTIVITIES TO IMPROVE SAFETY



Section K

- **Discharge reductions (BPM)**
- **Periodic Reviews**
- **Passivation of ILW**
- **Minimisation of liquid HLW**
- **Institutional Change**
- **Site Remediation Plans**
- **Decisions on Long Term RWM**

SELLAFIELD DISCHARGES

- **Sellafield accounts for the majority of UK radioactive discharges**
- **When revised discharge authorisations for Sellafield are approved, they will:**
  - **Reduce already low potential doses to the most exposed members of the public even further - by between 25% and 35%, at the discharge limits**
  - **Improve requirements for management arrangement including Environmental Operating Rules**

UK DISCHARGES – THE FUTURE

UK strategy for radioactive discharges 2001 - 2020 sets out how the UK will implement 1998 OSPAR Ministerial Statement on radioactive discharges

- **Establishes framework for achieving progressive and substantial reductions in discharges by 2020 (target 20 microSv target for most potential exposure to individual)**
- **Sets discharge reduction targets, by sector**
- **Targets will be met through a combination of facilities closing and the application of 'best practicable means' to reduce discharges**

PERIODIC REVIEWS

Safety and environmental protection will continue to be improved by:

- **periodic reviews of safety under Licence Conditions; and**
- **periodic reviews of discharge authorisations by the environment agencies.**

Decommissioning strategies reviewed by HSE every 5 years under Government policy.

PASSIVE SAFETY FOR ILW

Work continues to condition ILW into a passively safe form for long term storage pending a final decision on long term management.

MINIMISATION OF LIQUID HLW

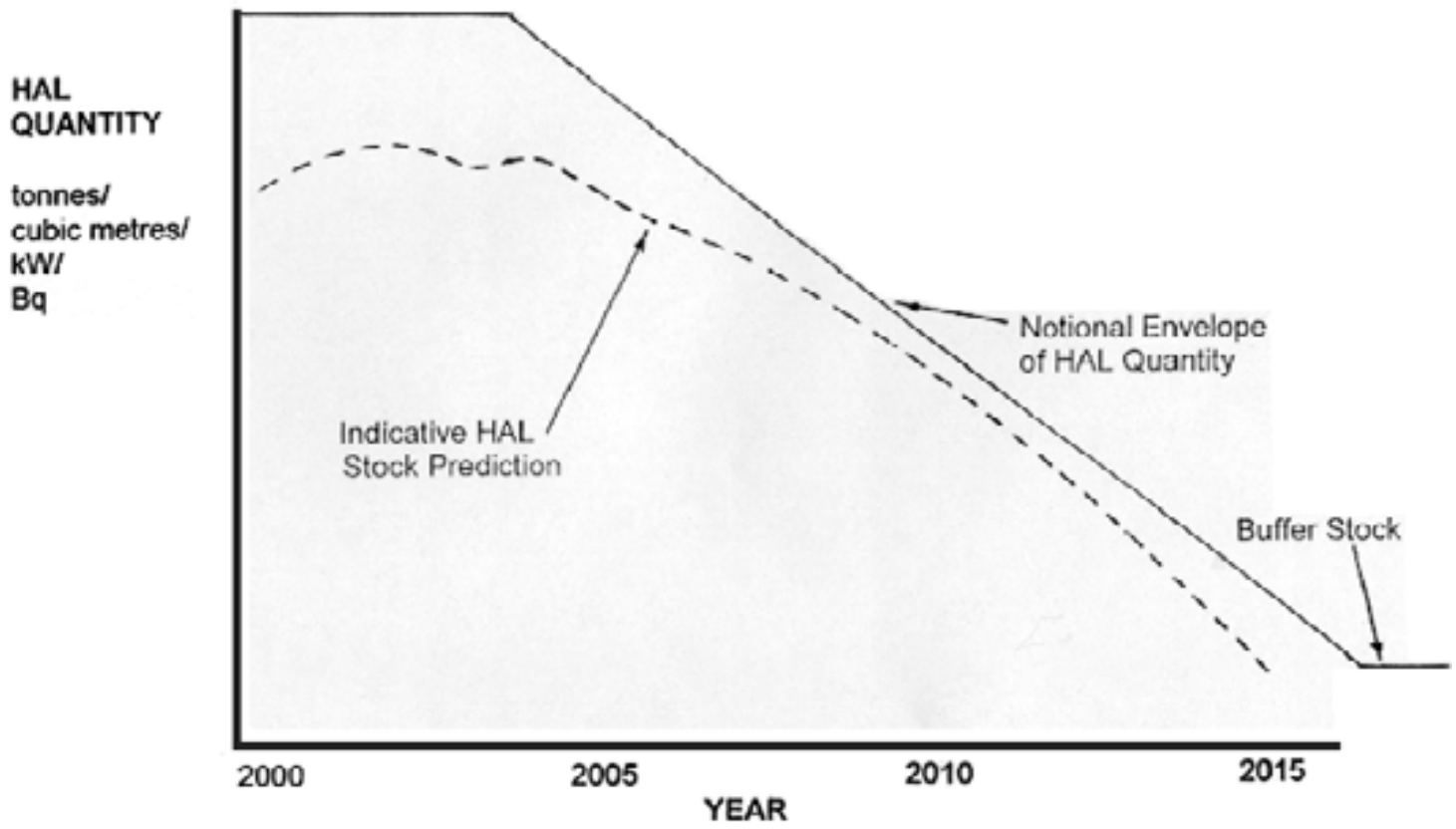


Figure 6 Notional envelope of HAL Quantity

INSTITUTIONAL CHANGE - NUCLEAR DECOMMISSIONING AUTHORITY

Subject to legislation, NDA will:

- **be created in April 2005**
- **have financial responsibility for clean-up at UK civil public sector nuclear sites**

It is expected to have a statutory duty to

- **maintain ongoing operations**
- **ensure the legacy is dealt with safely, securely and cost effectively with care for the environment**
- **achieve strategic management of legacy waste**

SITE REMEDIATION PLANS

- | and implementing
  ns to comply with

- nt of this will be
  ected requirements
  nmissioning
  JK strategic

DECISIONS ON LONG TERM RWM - LONG TERM RADIOACTIVE WASTE POLICY

Stage 1 (September 2001): consultation "Managing Radioactive Wastes Safely".

Stage 2:

- **2003** – Independent Committee on Radioactive Waste Management (CoRWM) appointed to oversee review process.
- **2005** – CoRWM to make recommendations on the option, or combination of options, for managing radioactive waste; Government to make the decision.

LONG TERM RADIOACTIVE WASTE POLICY

Stage 3 (2006): public debate on how the decision should be implemented including any site selection criteria.

Stage 4 (2007): start of the implementation process including any necessary legislation.

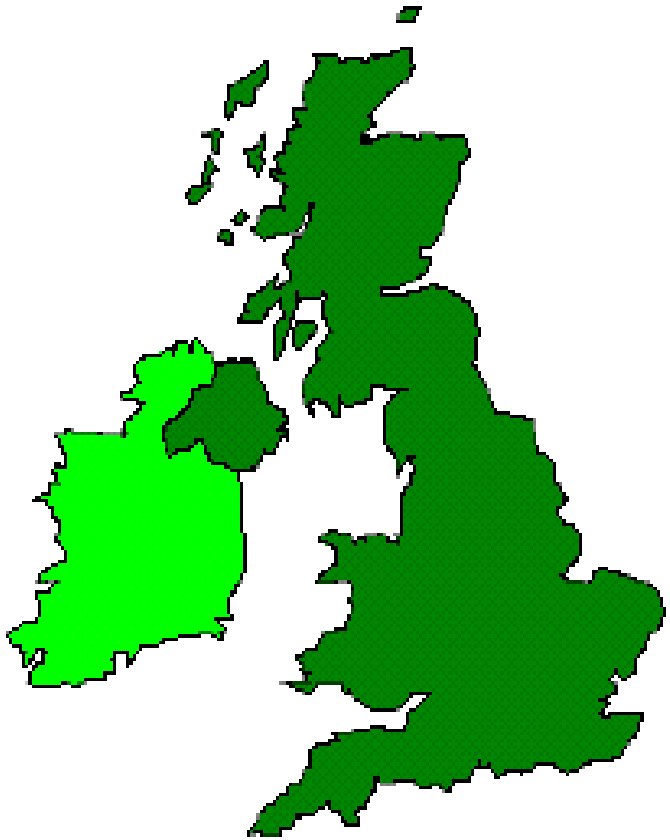
(Timetable is indicative)

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE

UK NATIONAL REPORT PRESENTATION - MAIN POINTS

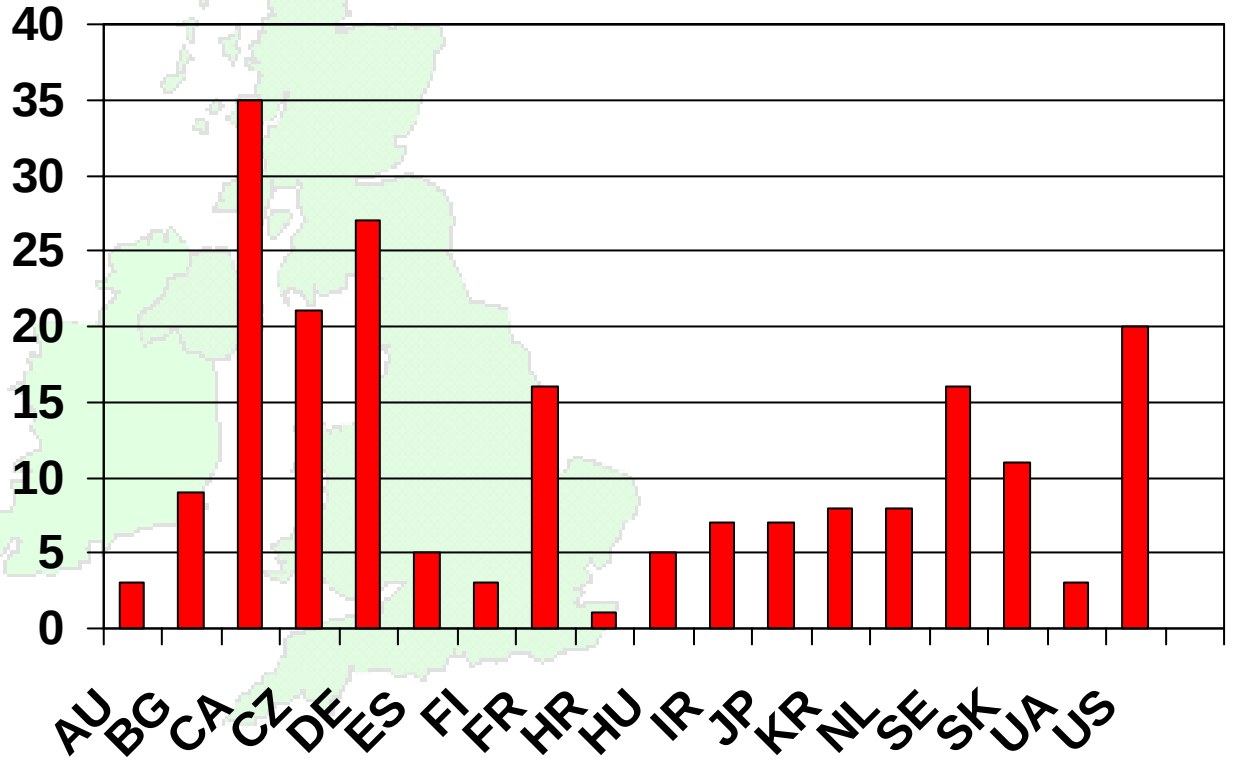
- Long complex history of diverse nuclear facilities
- Well developed policy and regulatory framework, goal setting – ALARP/BPM
- Secured high levels of safety for SFM & RW using common licensing system
- Culture and mechanisms for continuous improvement via ALARP/BPM, periodic reviews, institutional change
- Sound basis for next phase – major decommissioning and site remediation while maintaining high levels of operational safety

ANSWERS TO QUESTIONS RECEIVED



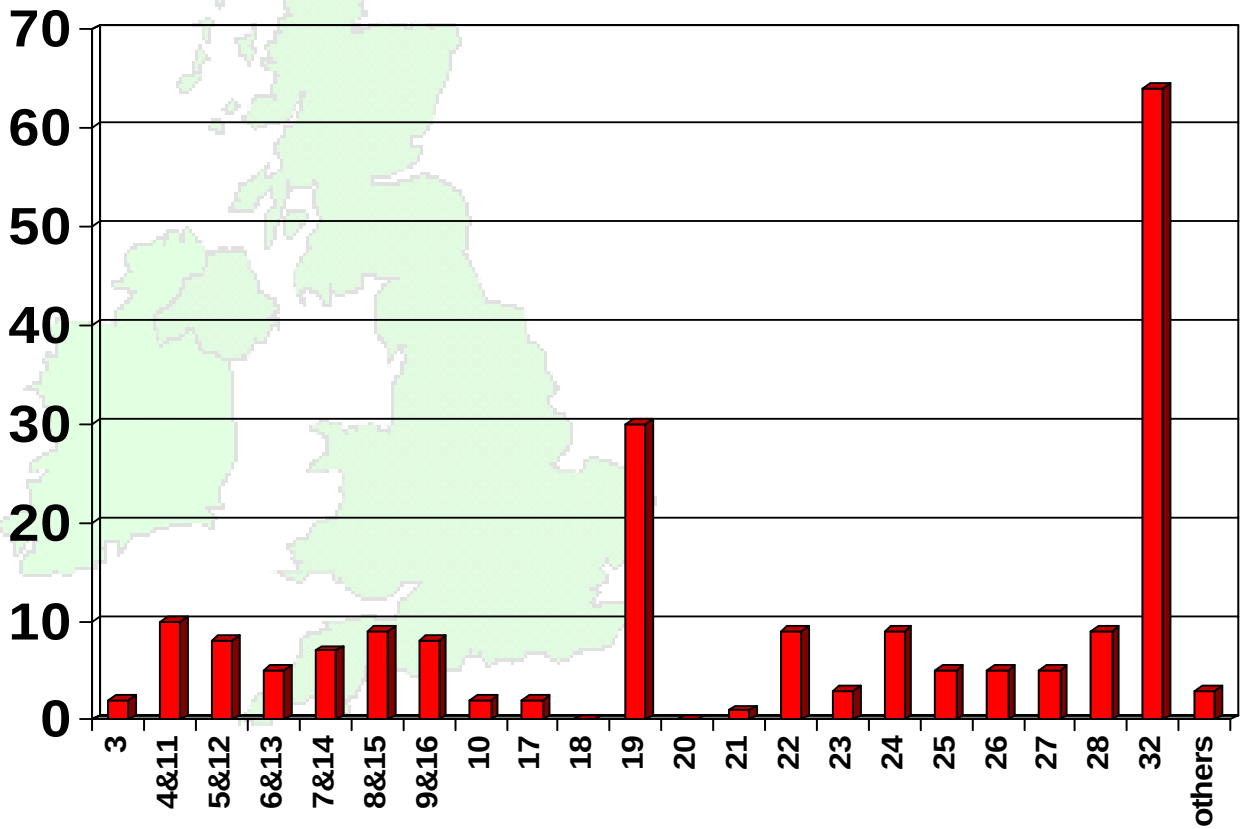
ANSWERS TO QUESTIONS RECEIVED

204 questions/comments from 18 countries



ANSWERS TO QUESTIONS RECEIVED

Analysis of Questions by Convention Article



ANSWERS TO QUESTIONS RECEIVED

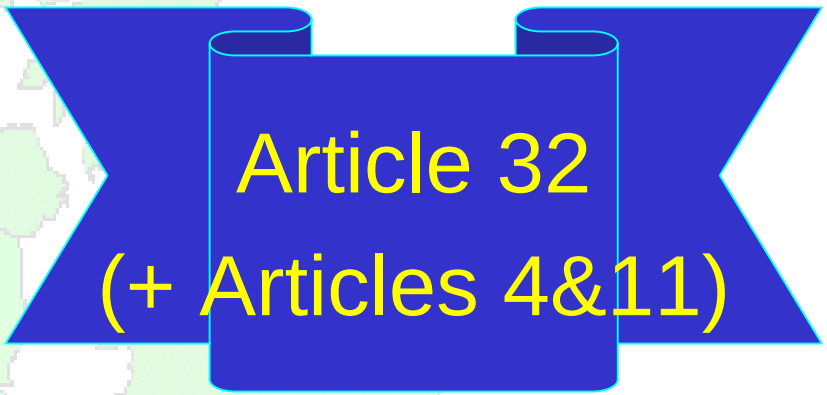
- **Written answers have been provided to all questions**
- **We cannot address all questions in the time available for this presentation**
- **This presentation will address generic questions in the following topic areas (covers ~50% of questions asked)**

Topic Areas Covered

- **Article 32**
  - National Policy
  - Practices
  - Facilities
  - Inventory
  - Future Generations
- **Article 19**
  - Licensing
  - Inspection
- **Article 22**
  - Financial Provisions
- **Articles 8 & 15**
  - Safety Assessments
- **Article 12**
  - Interventions
- **Article 24**
  - Discharge Authorisations
- **Article 28**
  - Disused sealed sources

REPORTING REQUIREMENTS

64 questions received



NATIONAL POLICY
UK plans for future disposal facilities?

- Managing Radioactive Waste Safely process described earlier – stakeholder consultation is the key.

- There are no prior assumptions about the strategy (including whether deep geological disposal is the way forward).

NATIONAL POLICY
UK plans for future disposal facilities?

Most of the questions cannot be answered now as the future strategy will be decided in the light of the report from the Committee on Radioactive Waste Management (CoRWM) in 2005 – cannot predict stakeholder consultation outcome .

NATIONAL POLICY
RWM principles and historic wastes?

- Radioactive Waste Management principles apply equally to historical wastes as to any other radioactive wastes.
- All of the historical waste has an identified owner who has to develop the waste management strategy and pay.
- It is expected that the responsibility for much of the nuclear legacy will be transferred to the Nuclear Decommissioning Authority(NDA), who will be charged with decommissioning it in accordance with Government policy.

NATIONAL POLICY
Impact on future generations?

- A Government White Paper (Cm 2919-June 1995) records the Government's responsibility to future generations.
- It is a feature of the UK’s non-prescriptive regulatory regime of general duties that regulators take account of Government policy, including sustainable development.
- Such issues are generally dealt with in guidance produced by the regulators rather than in specific regulatory provisions.

PRACTICES
HLW at Dounreay?

- ategy was to vitrify liquid
- ving the options available, the waste.
- ete and no firm decisions

PRACTICES
HLW at Dounreay - transport?

- Any proposal to transport liquid HLW to the Sellafield vitrification facility would be subject to rigorous assessment by all relevant regulators.

- No such proposals have been put to regulators, hence it is not possible to say whether the UK would consider such an option to be viable.

PRACTICES
Drigg Capacity?

- Currently, Drigg has a foreseen future life of around 50 years.
- This will not be sufficient for all predicted arisings.
- The UK will take the steps necessary in the future to ensure safe management of all predicted waste, following appropriate public consultation.

PRACTICES
Drigg Conditions for Acceptance?

The Drigg Conditions for Acceptance (CFA) are essentially:

- the size of waste
  - based on waste volumes and whether the waste is containerised or uncontainerised
- physical, chemical & radiological conditions:
  - wood, soil/rubble, metal, soft organics, etc;
  - list of 'prohibited' chemicals;
  - <4GBq/te alpha isotopes, <12GBq/te 'other' isotopes;

  no pathogens or putrescible wastes.


BOSS

PRACTICES
Drigg – Institutional Wastes?

- Drigg accepts such wastes
- BNFL has contracts in place with private and public sector consignors of LLW to Drigg to recovery all costs associated with the disposal of their wastes.
- Prices are set for each radionuclide grouping and applied to all consignors.
- In addition there is also a charge for volumetric usage.

PRACTICES
Drigg – Institutional Wastes?

- The consignor is responsible for the collection, conditioning, package and transport of waste for disposal at Drigg.

- In some very limited situations individual consignors have contracted BNFL to undertake a transportation service.

FACILITIES
More detail requested

- The UK gave the amount of detail it thought appropriate in its report.
- Written answers have been given where information was already public domain.
- The UK will review the amount of detail in its next report in light of the outcome of this review meeting.

RADIOACTIVE WASTE INVENTORY
More detail requested

- Full activity details are given in "The 2001 United Kingdom Radioactive Waste Inventory" (Ref 10 in the UK report).

- It can be found at www.nirex.co.uk/ipublicn.htm

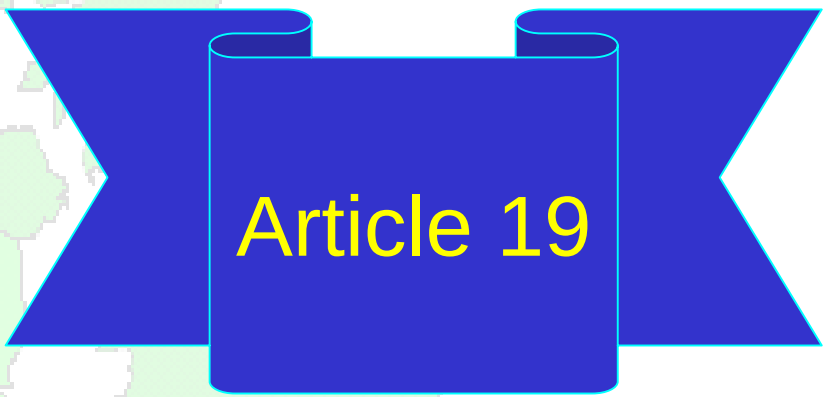
RADIOACTIVE WASTE INVENTORY
pre-1991 disposals to Drigg?

- Trench 1 1959-63 39,351m^3
- Trench 2 1963-73 93,647m^3
- Trench 3 1973-79 119,984m^3
- Trench 4 1979-81 137,871m^3
- Trench 5 1981-83 85,973m^3
- Trench 6 1983-85 92,563m^3
- Trench 7 1985-95 222,002m^3

Total
~800,000m^3

LEGISLATIVE AND REGULATORY FRAMEWORK

15 questions received



LICENSING
Clearance Criteria?

Radioactive waste is cleared from regulatory control if it is either:

- below specified limits for naturally occurring radionuclides set out in RSA93; or
- within limits set out in 'Exemption Orders' made under RSA93.

LICENSING
Clearance Criteria?

The most frequently used Exemption Order is the Substances of Low Activity Exemption Order (SoLA).

SoLA specifies that solid radioactive waste is “exempt” if:

- it is substantially insoluble in water and has an activity <0.4 Bq/g;
- it also applies to organic liquids and short-lived (less than 100 seconds half-life) gases.

LICENSING
Where do the Acts apply?

- NIA65 applies throughout the UK.
- There are no nuclear installations in Northern Ireland and the Act therefore has no effect there.
- RSA93 is a UK wide Act. Implementation in Northern Ireland is via Regulations and Directions which are equivalent to those introduced in the rest of the UK.

LICENSING
Revoking/surrender of licence?

- In the event of a site licence being revoked or surrendered, a licensee will still have responsibilities for the safety of workers and the general public under other legislation.

- Additionally NIA65 provides that "*HSE may on revocation or surrender .. give to the licensee such other directions as the HSE may think fit for preventing or giving warning of any risk of injury to any person or damage to any property by ionising radiations from anything remaining on the site.*"

LICENSING
Need for LCs in decommissioning?

- Licence Conditions are non-prescriptive in nature and allow for compliance to be tailored to the activities being regulated.
- Each condition generally requires the licensee to make and implement “adequate arrangements for….”.
- What constitutes “adequate” arrangements under each licence condition will take account of the different levels of hazard posed by operating and decommissioning installations.

LICENSING
Consistency between regulatory bodies?

- Close liaison between Industrial Pollution and Radiochemical Inspectorate, EA and SEPA via working groups, topic conferences and training courses helps to ensure that inspection and enforcement approaches are consistent.

- Relationships between HSE and EA/SEPA are formalised in Memoranda of Understanding.

LICENSING
Public consultation?

- Principle – If short term regulatory decision then by independent regulator alone but if long term impact on public or out with regulatory control then public consultation.

- Consult on the planned long term review/revision of site licence conditions and of the Safety Assessment Principles, and impact of licensees' decommissioning strategies.

- But NII would issue a Direction to shut down a facility or stop an operation without public consultation.

LICENSING
Public consultation?

- Each major licensed nuclear site has a local liaison committee(LLC).

- Every quarter the HSE site inspector prepares a LLC Report describing regulatory activities and outcomes at that site over the previous 3 months. These are publicly available on the HSE website.

- Regulators attend LLC meetings, report on any regulatory actions taken and respond to any questions raised there.

LICENSING
Public consultation?

- Planning permission is required for any development of land.

- Given the importance of planning application decisions for major radioactive waste management facilities, such applications would be likely to be “called-in” for ministerial decision and a local Public Inquiry set up.

- Recent example for Trawsfynydd NPP

LICENSING
Public consultation?

- For installations which need to be licensed HSE may direct the licence applicant to notify specified public bodies that an application has been made.

- The purpose of this is to enable the public bodies to draw to the attention of HSE anything which, from the perspective of their own duties in relation to the site, should be reflected in the conditions to be attached to the licence.

LICENSING
Public consultation?

- The environment agencies review authorisations for the disposal of radioactive waste from nuclear facilities typically every five years.

- In doing so the environment agencies consult with local authorities, other relevant bodies and the public.

LICENSING
Public consultation?

- With regard to waste disposal sites, the Government has recently initiated a public debate on the provision of long-term radioactive waste management facilities for intermediate level radioactive waste. This will involve extensive public engagement on both the nature and siting of facilities.

INSPECTION
HSE Inspection activities?

- HSE/NII carries out two main types of inspection: routine and reactive.

- Routine inspections to implement a planned programme to inspect and enforce licensees' compliance with the 36 standard licence conditions and other legislation.

- Reactive inspections respond to specific plant events.

INSPECTION
Regulatory reviews?

- NII's reinvigorated regulatory review process is designed to formulate a view of the Licensees' nuclear safety performance.

- At regulatory reviews the following are considered:
  - the outcomes from compliance Inspections;
  - the Licensees' ability to create and maintain safety cases;
  - incidents and events arising during the year;

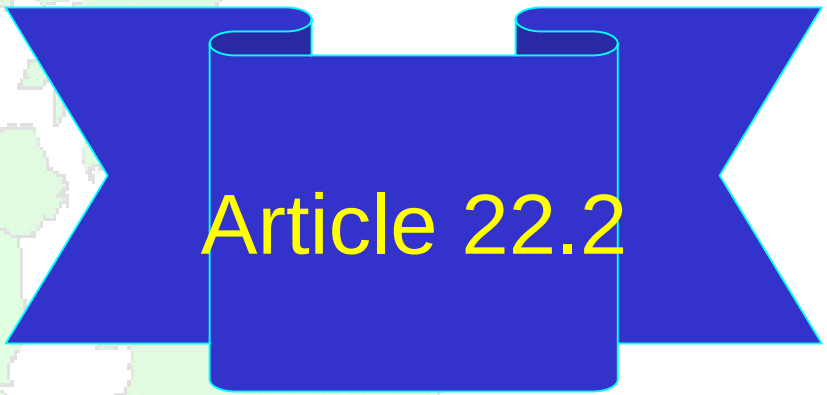
INSPECTION
Regulatory reviews?

- significant changes to expected regulatory related projects for the forthcoming year;
- changes in political environment;
- changes in public attitude to the site.

- All UK sites are subject to this process of annual review.

FINANCIAL PROVISIONS

9 questions received



FINANCIAL PROVISIONS
Discount Rate?

- Assets included in decommissioning funds are usually included at market value.

- The discount rate used to calculate liabilities is set to reflect the value of money and the risks included in the cash flow.

- Each operator determines the criteria to be used in determining the discount rates etc on the basis of the type of plant involved, his own decommissioning requirements etc.

FINANCIAL PROVISIONS
Adequacy / Oversight?

- ıply with UK company legislation, including solvency and auditing provisions. The criteria used to determine the adequacy of operators' decommissioning provisions are a matter for their auditors.

- HSE has published guidance on its approach to undertaking 5 yearly reviews of decommissioning strategies.

- See Appendix 6 and paragraph F-119 of the National Report.

FINANCIAL PROVISIONS
Nuclear Decommissioning Authority?

- The legislation to introduce the NDA (published in draft June 2003), is expected to be introduced to Parliament at the end of November 2003.

- The NDA is expected to be Government funded and to deal with the historic liabilities of BNFL and UKAEA.

FINANCIAL PROVISIONS
BE - Nuclear Decommissioning Fund

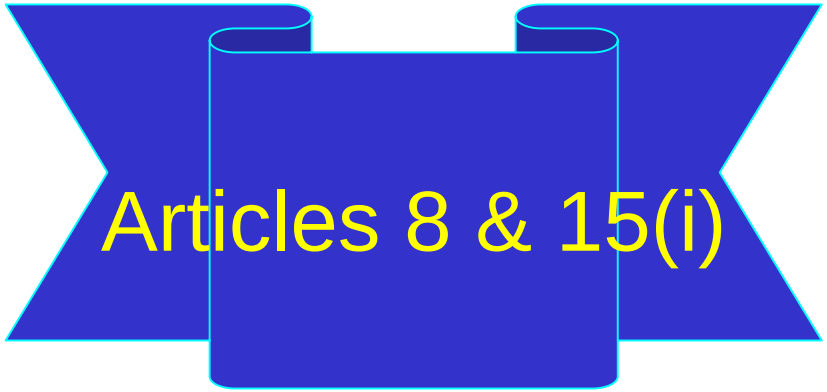
- Subject to final agreements, current arrangements will be subsumed into a new Nuclear Liabilities Fund (NLF) to fund decommissioning and uncontracted liabilities.
- BE will give to the NLF:
  - £20M/y, indexed to inflation and tapering as stations close
  - £150,000 (indexed to RPI) for every tonne of fuel loaded into the Sizewell B PWR
  - £275 million of new bonds
  - 65% of its free cash flow

FINANCIAL PROVISIONS
Nuclear Decommissioning Fund

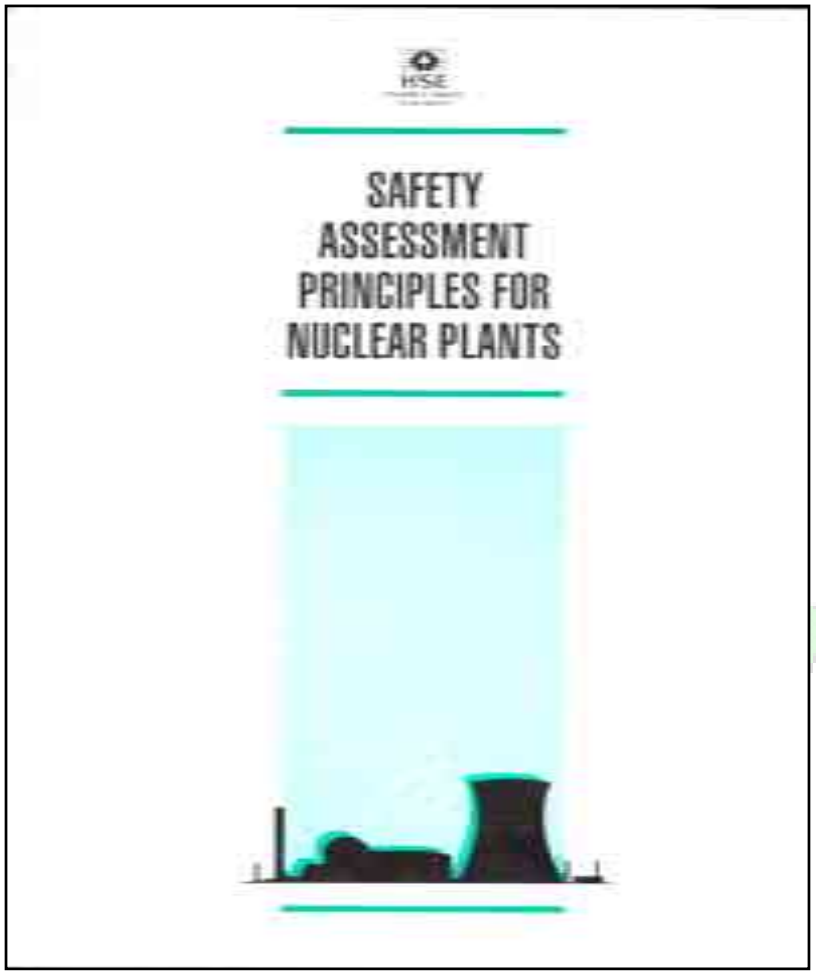
- If the assets of the NLF are insufficient to fund the liabilities, any shortfall will be met by Government to ensure safety and environmental protection.

SAFETY ASSESSMENTS

8 questions received



SAFETY ASSESSMENTS
Criteria?



The key criteria against which safety cases are assessed are those contained in HSE's "Safety Assessment Principles for Nuclear Plants"

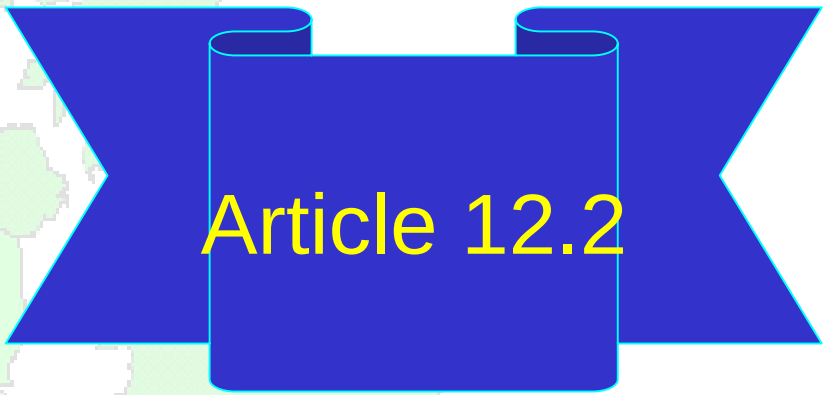
ENVIRONMENTAL ASSESSMENT near surface disposal?

The regulatory advice on environmental assessment of near surface disposal is published in Reference 76 to the UK report:

"*Disposal Facilities on Land for Low and Intermediate Level Wastes: Guidance on Requirements for Authorisation, EA, SEPA & DoE for Northern Ireland (GRA)*"

INTERVENTIONS

7 questions received



INTERVENTIONS
Past Experience?

- There have not been any interventions for past practices in the UK.

- Where contamination from past practices has been remediated this has been carried out for reasons other than radiological protection; quantities of radioactive waste produced have been small.

INTERVENTIONS
Contaminated Soil – experience?

- There are examples of soil contamination on a number of nuclear sites due to historic leaks or spills.

- There are instances of leaks, spills and disposals on a number of non-licensed sites, especially those which operated before the current regulatory regime was introduced; the most common source is due to historical radium luminising activities.

INTERVENTIONS
Contaminated Soil – limits?

- There are no activity limits set for contaminated soil.

- Before de-licensing, following decommissioning, HSE must be satisfied that there is no longer any danger from ionising radiations from anything on the site.

INTERVENTIONS
Contaminated Soil – disposal?

Although the national low-level radioactive waste disposal site at Drigg in Cumbria is used for the disposal of contaminated soil classified as low level waste, it does not have the capacity to deal with all the contaminated material from decommissioning and remediation of UK sites.

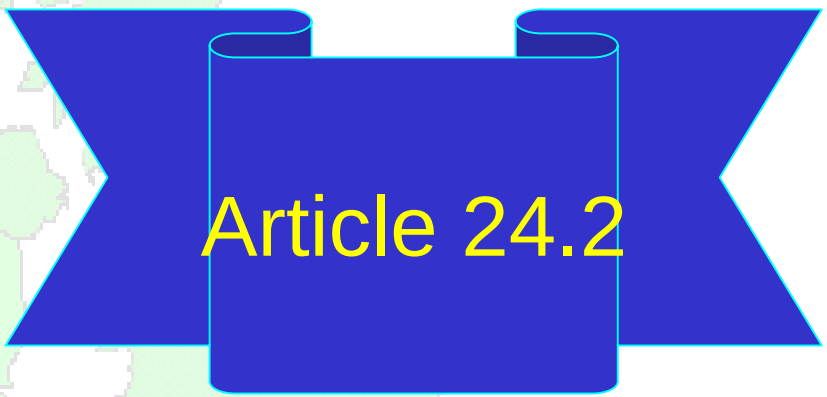
INTERVENTIONS
Contaminated Soil – storage?

- The owner or operator is responsible for decisions on how or where to store large volumes of radioactively contaminated soil.

- If the soil is considered to be stored pending future treatment or disposal then, on nuclear licensed sites, this will be regulated by HSE under the site licence as an accumulation of radioactive waste.

DISCHARGE AUTHORISATIONS

5 questions received



DISCHARGE AUTHORISATIONS
How are limits set?

- Limits for discharges to air and water are specified in certificates of Authorisation which set out:
  - the routes which the operator is permitted to use to discharge radioactive wastes
  - the numerical limit for each radionuclide (or group)
  - the time period for which the limit applies.

DISCHARGE AUTHORISATIONS
How are limits set?

- Doses due to emissions from neighbouring facilities are taken into account, as are direct radiation levels.

- Activity resulting from historical discharges is taken into account in dose assessments, but the contribution from natural radioactivity is not.

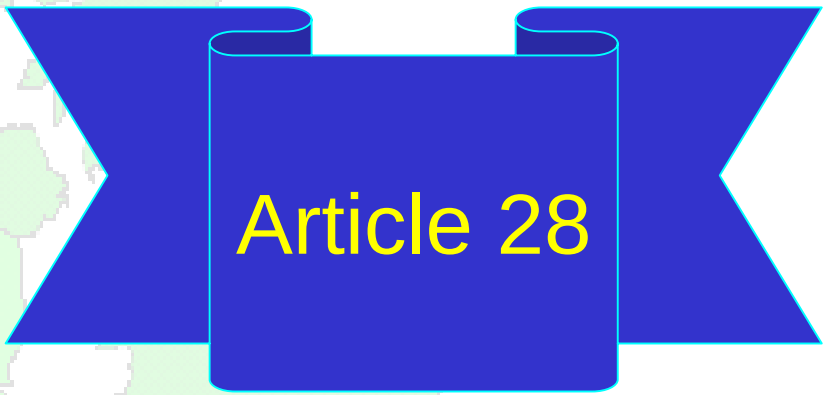
DISCHARGE AUTHORISATIONS
Data on releases and doses?

- The annual report "Radioactivity in Food and the Environment" includes data on actual discharges made in 2002 and authorised discharge limits, for all nuclear installations in the UK.

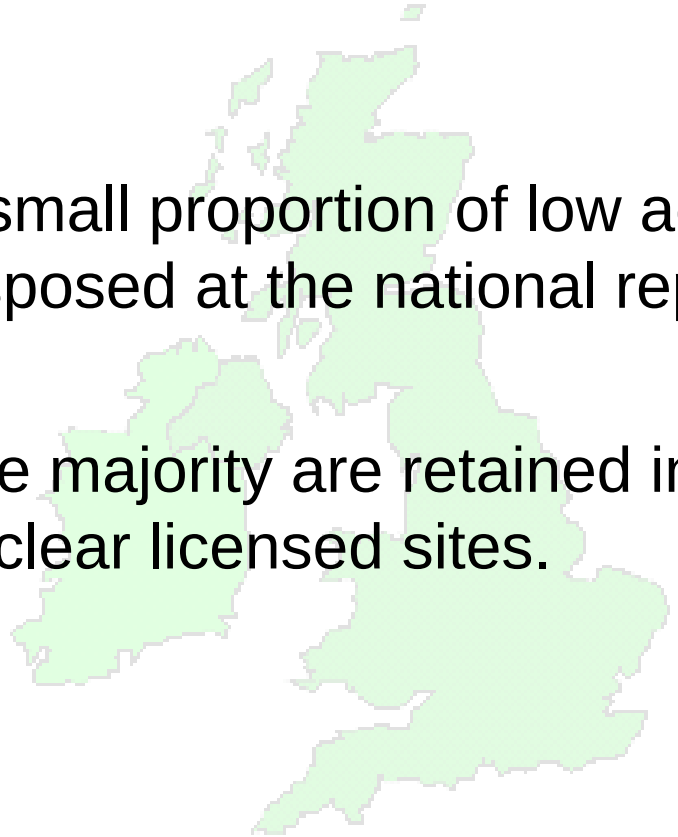
- The report "UK Strategy for Radioactive Discharges 2001-2020" has graphs showing discharges from UK nuclear industry sectors from 1979 to 2000 and estimates of future discharges to 2020 (target of at most 20 microSv predicted maximum dose).

DISUSED SEALED SOURCES

9 questions received



DISUSED SEALED SOURCES
Disposal?



- A small proportion of low activity sources are disposed at the national repository at Drigg.

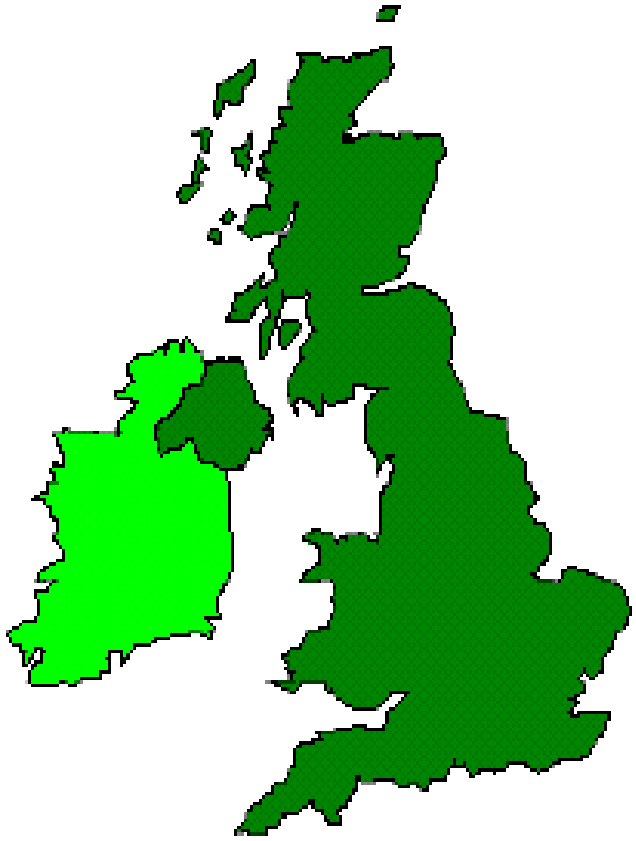
- The majority are retained in long-term stores on nuclear licensed sites.

DISUSED SEALED SOURCES
Return to UK?

There is no legal constraint on the return of disused sealed sources manufactured in the UK.

The UK supports the internationally preferred option of return to the supplier.

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE



The United Kingdom of Great Britain and Northern Ireland

NATIONAL REPORT PRESENTATION

For the

First Review Meeting

3rd to 14th November 2003, Vienna