Office for Nuclear Regulation

# The role of the regulator in supporting the development of UK plutonium management policy

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Office for Nuclear Regulation

# Presentation structure

- Recent changes - Office for Nuclear Regulation
- UK regulatory regime
- UK Plutonium management – role of the regulator

# Office for Nuclear Regulation

- Nuclear Installations Inspectorate – established in 1960 to regulate safety in the civil nuclear industry
- 1975 become a division of the Health and Safety Executive
- 2011 ONR formed as agency as a “One stop shop” for the regulation of **safety, security, transport safeguards and conventional safety**
- Energy Act 2013 – created ONR independent organisation
- Duty to enforce provisions of the Act

# ONR Mission Statement

"To provide efficient and effective regulation of the nuclear industry, holding it to account on behalf of the public"

# How we are organised

- ONR is organised in to operational delivery programmes to reflect nuclear industry sectors.
- The ONR Executive Leadership Team is responsible for the running of ONR.
- ONR employs around 450 staff and is governed by a Board of executive and non executive directors.

# ONR's regulatory priorities for 2014/15

- UK government energy policy to have low carbon energy generation
- Nuclear new build and nuclear defence
- Decommissioning
- Radioactive waste management
- Legacy from 1st generation power plants

# UK Regulatory Regime

- Energy Act 2013 provides framework and responsibilities
- How we regulate our sites
    - 36 licence conditions attached to the site licence
    - Permissioning inspection
    - Compliance inspection
    - Enforcement
    - Influence
    - Also Includes security, transport, safeguards and conventional safety

# Nuclear Licensed sites in the UK


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# UK Plutonium management

## Role of the Regulator

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# UK Plutonium management

- UK Plutonium is stored safely and securely
- Consolidation of packages from older stores at Dounreay and Sellafield is underway
- Sellafield MOX Plant closed in August 2011

# UK Policy/Options

- NDA and EDf Energy own the UK civil plutonium stockpile
- The UK is still producing plutonium from the reprocessing of spent Oxide and Magnox fuel

- **Three cedible options:**

  1 Continued long term storage (prior to disposal)

  2 Reuse as fuel followed by disposal

  3 Immobilisation and disposal as soon as practicable

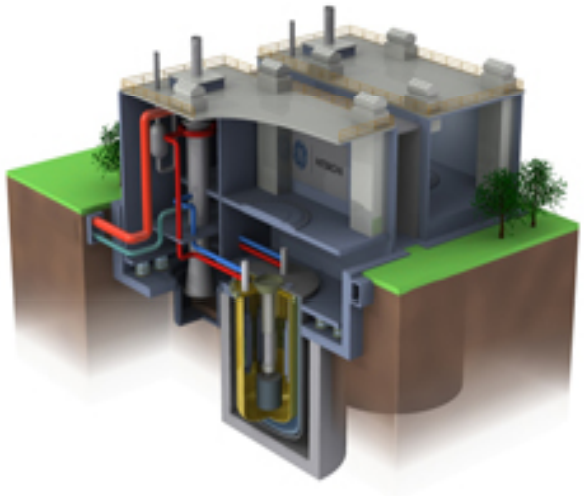
  Government prefered option is currently reuse as MOX

# UK Policy/Options

- NDA have been supporting the UK Government in developing its policy for the management of the UK plutonium stocks.
- 3 Credible reuse options are actively being considered by the NDA:
  - Fabrication of MOX in an AREVA plant followed by irradiation in a Light Water Reactor.
  - Fabrication of CANMOX in GE Hitachi designed MOX plant followed by irradiation in CANDU EC-6 Heavy Water Reactor
  - Fabrication of metallic fuel in a GE Hitachi designed fuel plant followed by irradiation in PRISM fast reactors.

- Currently not clear which proposal is best for UK
- NDA final selection criteria will be based on safety , security, environment and economics
- Current regulatory advice is based on limited information that is available

# Reactor types



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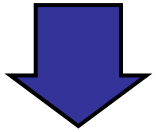
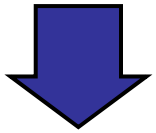
Retrieval of plutonium from Sellafield stores and preparation for suitability for fuel manufacture

Fuel manufacture into “assemblies



Irradiation in reactor (types, loadings)



Spent fuel management including disposal to a Geological Disposal Facility

# ONR approach

- For regulators: “To provide advice to Nuclear Decommissioning Authority (NDA) on the suitability of each proposal to enter a UK regulatory permissioning process based on information provided by the proposer”

# Purpose and scope of our work

- To develop an understanding of the prospects for licensing the lifecycle Pu disposition concept
- Develop an overview of what work is required to licence each disposition concept under the UK regulatory regime
- Concept is to cover the lifecycle for plutonium disposition
- Develop understanding of each option over the full cycle

# Approach to permissioning

- Early days – still at concept stage
- Regulators will apply a structured process for assessment of each lifecycle plutonium disposition concept
- Safety, security, safeguards, transport and conventional safety

# Approach to permissioning

- First stage is for consortia to scope and set out their proposals
- Regulators role is to advise the NDA on the suitability of any proposal i.e. Can it be licensed with the UK regime
- NDA will use this information to support their recommendation to UK Government
- Use of ONR existing established reactor Generic Design Assessment process.

# Key information to support assessment

- A comprehensive outline of the lifecycle plutonium management option, including
  - key assumptions
  - licensability of facilities
  - full lifecycle management plan
  - waste from the manufacture of fuel and spent fuel including disposability
- A comprehensive process flowsheet
- Safety, security, safeguards, transport and environmental considerations

# Risks to making it happen

- Important that regulators initial suitability assessment is robust because:

- UK permissioning regime requires detailed and intrusive assessment of facility safety cases to enable a judgement to be made that risks are as low as reasonably practical

- If its not safe and secure ONR will not allow operation

# Final thoughts

- Safety and security is paramount
- UK regulators are involved in early stages
- Final decision rests with UK Government
- Regulators must ensure final licensing decision is robust
- International collaboration is essential
- ONR website. www.onr.org.uk

# Any Questions ?