



**UK Nuclear Academics
meeting 14-15 September
University of Bristol**

**Overview of the Royal
Society's nuclear policy
work and advice to
Government**

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THE
ROYAL
SOCIETY

Key messages

The Government needs to define a long term strategy for nuclear power

A long term strategy for nuclear power can then inform long term strategy for research and development (R&D)

R&D keeps future policy options open

Examples of policy activities

The management of the UK's separated plutonium, 1998 (study)

Long term management of radioactive wastes, 2006 (consultation response)

Strategy options of the UK's separated plutonium, 2007 (study)

Detecting nuclear and radiological materials, 2008 (international workshop)

Fuel cycle stewardship in a nuclear renaissance, 2011 (study)

Future views on nuclear power and technology, 2012 (international Discussion Meeting)

New siting process for a geological disposal facility, 2013 (roundtable)

The plutonium story

1998: outlines various options to manage the stockpile

2007: update due to key developments

- Tony Blair gives support for new nuclear
- Establishment of the NDA in 2005, and Pu management central to strategies at Sellafield
- Security a political priority following 9/11
- Outlines new possible route: reuse in new reactors

Major impact

- Independence of 2007 report allowed NDA management to engage Ministers on Pu
- Work behind the scenes to provide informal, expert review

2011: study on management best practices to manage proliferation and security risks

- Recommends Pu to be reused in new LWRs, but will require a new MOX fabrication facility
- Long term future of reprocessing in the UK needs careful consideration

Major impact

- Government default position is reuse

Radioactive waste management

2006: advice about long term management options

- Supports geological disposal as the favoured option
- Provide advice about the work of CORWM

2013: provides advice about the siting process for a new GDF

- Importance of the safety case (not just natural but also engineering barriers)
- Key role of the Office of Nuclear Regulation acting in public interest

Nuclear security

2008: workshop on nuclear detection and forensics capabilities

- Commissioned by MoD CSA
- Beginning of partnership with AWE Threat Reduction
- Strong international involvement: USA (JASONs); Russia; France; Israel

Major impact

- Led to research partnerships with academia and industry (breaking down the rigid classified vs unclassified divide)

2011: study on management best practices to manage proliferation and security risks

- Study funded by FCO, MoD and DECC
- Included unclassified evidence workshops with AWE expertise
- Recommendations to support Threat Reduction research
- AWE should exploit the Blacknest model, so that the wider scientific community, including international partners, can engage effectively with this expertise in a non- classified environment.

Nuclear non-proliferation

2011: study on management best practices to manage proliferation and security risks

- Study funded by FCO, MoD and DECC
- Must avoid non-complacency as more nations look (at that time) to nuclear power to meet their energy and climate change needs
- There is no proliferation resistant fuel cycle
- Proliferation resistance is a matter of degree (c.f. water proof vs water resistant to 100m)
- Safeguardability of fuel cycles should be the R&D priority for non-proliferation
- Integrated approaches to the management, regulation and global governance of nuclear materials: safety, security and safeguards ('3Ss')
- The Office of Nuclear Regulation should develop its integrated approach to nuclear regulation by ensuring that security features explicitly in nuclear site licensing conditions. This may require the Government to update the Nuclear Installations Act.

Cradle to grave planning

2011: study on management best practices to manage proliferation and security risks

- Spent fuel can no longer be an afterthought
- Governments should establish long term policy for nuclear power that should specify from the outset the requirements for managing spent fuel and radioactive wastes, including sufficient capacity for interim storage, and initiating plans for delivering timely geological disposal
- Operators should formulate spent fuel management strategies that cover the entire lifetime of their reactors. International fuel cycle arrangements should be sought, especially when national capacity is lacking.
- Governments, industry and academia should develop a long term R&D roadmap to support these management strategies based on participation in international R&D programmes.
- Governments should support collaborative R&D programmes on spent fuel and radioactive waste management, including joint studies to explore international fuel cycle arrangements, including geological disposal (although there would be no need for commitments to implement them immediately).

Nuclear R&D

- DECC should develop a strategy that addresses the future role of nuclear power in the UK's long term energy policy. This could be facilitated by a high level, Civil Nuclear Power Council based in DECC that brings together senior representatives from the UK's nuclear industry and senior officials from government departments and agencies.
- A long term strategy for nuclear power in the UK would guide a long R&D roadmap. It should be based on a review of current UK R&D, relevant international programmes and suitable UK participation in them.
- The implementation of a long term R&D roadmap will need to be supported principally by government funds but also draw on industry sources. It will involve universities, the NNL and other relevant research organisations. NNL's facilities must be fully commissioned and suitable access provided to researchers to use them.

Major impact

- Informed the House of Lords review on nuclear R&D needs
- Informed the Beddington review and setting up of NIRO and NIRAB

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