

The UK and nuclear reprocessing: beating a retreat

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May 2007

Intrinsic problems with reprocessing/recycling

1. Increased cost & complexity of waste management
2. Difficulty of technical & institutional coordination
3. State-industry nexus: resistance to effective public accountability & control
4. Policy inflexibility, irreversibility
5. Linkage to nuclear weapons
6. Cost and difficulty of safeguarding complex flow processes.

The UK's reprocessing facilities

Sellafield (Cumbria, England)

- B205 (domestic Magnox reactor fuel). Due to close in 2012.
- THORP (foreign Light-Water Reactor, LWR, fuel; domestic Advanced Gas-Cooled Reactor, AGR, fuel). Due to close in 2011.

Dounreay (north of Scotland):

- Facility for reprocessing prototype fast reactor fuel (closed)

Spent fuel from the UK's only LWRs (Sizewell B) is not reprocessed:
stored at reactor site

Spent fuel from submarine reactors is stored at Sellafield

THORP's history

- 1977-78 Windscale Inquiry; Parliament debates & approves
- 1994 Operation begins after further Parliamentary debates & a judicial review
- April 2005 THORP's closure after accident (leakage of radioactive liquor from accountancy tank)
- Summer 2007 (?) Planned reopening
- March 2011 Planned final closure after completion of remaining reprocessing contracts

Claimed benefits from THORP

1. Future availability of plutonium
 - = to fuel over 8 fast breeder reactors in UK (1978)
 - = recycling in thermal reactors (from early 90s)
2. More effective waste management & disposal
3. Large earnings from foreign contracts
 - = all plutonium & high activity wastes would be returned to customer countries
4. Proliferation benefits: discourages reprocessing in Japan & Germany

Performance of THORP and SMP

Thorp:

Design capacity: 1200 THM/yr

Average throughput, 1994-2005: 520 THM/yr

Sellafield MOX Plant (SMP): constructed in late 1990s to facilitate return of plutonium to foreign customers

Design capacity: 120 T/yr

Average MOX throughput, 2002-07: 1 T/yr

Plutonium & wastes have yet to be returned to customers

No MOX contracts with Japanese utilities

Result of UK's engagement with reprocessing

World's largest surplus stock of civil plutonium
(105 tonnes, end 2005, including 26.5 T of foreign
Pu, the majority Japanese)

No domestic recycling of plutonium, no disposition plan

Exacerbation of waste problems:

- multiple waste streams & forms
- radioactive pollution of seas and coastline
- no agreed disposal sites for high activity wastes

Heavy costs of clean-up & decommissioning

Policy reversal, 2002-07

UK's phased withdrawal from reprocessing by 2012

Why?

- Privatisation of electricity supply industry
- Plutonium fuels always uncompetitive with high burn-up uranium fuels
- Government's and utilities' disillusion with reprocessing & BNFL
- Desire to relaunch nuclear power in the UK: judged to be impossible with reprocessing & without public acceptance
- Post-9/11 worries about terrorist sabotage

Therefore, re-focus policy on decommissioning, waste disposal: deal with the "nuclear legacies"

Institutional change

Foundation of state-owned Nuclear Decommissioning Authority (NDA),
2005

“to ensure the safe, accelerated and affordable clean-up of the UK’s
civil nuclear legacy”

NDA assumes ownership of & responsibility for Sellafield, Dounreay
and other sites: BNFL dethroned, reduced to operator

Committee on Radioactive Waste Management (CoRWM): Report
published in July 2006

- = recommends deep disposal of wastes

- = proposes ending the “decide-announce-defend”
approach to nuclear policy-making

- = disposal sites should be selected through negotiation with
local authorities & communities

The UK's waste “legacy”

Arising from:

- abandoned fast reactor programme
- closed power reactors, reprocessing & fuel fabrication plants
- high volumes of waste (est. 478,000 cu. m.) of many kinds & forms, some of it untreated as yet

NDA's most recent cost estimate: £62.7bn undiscounted, £35.4bn discounted (Sellafield accounts for 63%)

Financed primarily by the tax payer: heavy burden on public purse

Reasons for policy failure

Exaggerated future benefits (wildly unrealistic forecasts)

BNFL's monopoly powers, sheltered by the state; utilities' ability to pass extra costs to electricity consumers unnoticed

History of industrial & political mismanagement

Weak Parliamentary oversight

Inadequate storage capacity outside Sellafield

Embedded commitments (political, contractual, infrastructural, local employment): 'lock-in', 'technological entrapment'

Refusal until very recently to consider alternatives & escape routes