



<http://www.nuclearwasteadvisory.co.uk>

Owen Jenkins
Office for Nuclear Development
Department of Energy and Climate Change (DECC)
1 Victoria Street
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25th March 2009

Emailed to: justification@decc.gsi.gov.uk

Dear Mr Jenkins,

Nuclear Waste Advisory Associates (NWAA) is an independent group of experts providing information and advice on the risks posed by radioactive waste, and support to decision makers, stakeholders and communities involved in its management. Two members of the group were previously members of the Committee on Radioactive Waste Management.

NWAA's purpose is to advise on minimising the risks to people and the environment now and in the future from the dangers of radioactive wastes. NWAA considers that this will be best accomplished by focusing on the safety and security of existing legacy wastes.

CoRWM

CoRWM's July 2006 recommendations dealt only with legacy waste. CoRWM said it takes no position on the desirability or otherwise of nuclear new build, but that such decisions "...should be subject to their own public assessment process [because they] raise different political and ethical issues when compared with the consideration of wastes which already exist". (1)

CoRWM said that new build waste will extend the time-scales for implementation of any solution to the waste problem, possibly for very long but essentially unforeseeable future periods. The Committee also noted that the prospect of a new nuclear programme might undermine proposals for urgently dealing with existing wastes.

The open and transparent way to examine the NIA's claims about waste would be to organize the type of public assessment process on new build waste recommended by CoRWM.

Environment Agency

The chair of the Environment Agency, Lord Smith, has said the long-term storage and disposal of high-level nuclear waste is the "*great unsolved issue*" of nuclear fission. "*It is an absolute necessity if a new nuclear programme goes ahead that the issue of high-level waste is properly resolved.*" (2)

The 2003 Energy White Paper said that there were issues about nuclear waste which needed to be resolved before proposals for new nuclear reactors could be brought forward. NWAA does not

believe that sufficient progress has been made on CoRWM's July 2006 recommendations on nuclear waste management to justify moving ahead with new reactors.

There are huge uncertainties surrounding the management of spent fuel from new nuclear reactors which need to be examined and discussed in an open and transparent way. Nuclear Waste Advisory Associates believe the construction of new reactors cannot be justified until these issues have been resolved.

DEFRA

In the mid 1990s, a Public Inquiry was held into the Nuclear Industry's plans to begin a deep burial programme for Radioactive Wastes. Following this Inquiry, the Planning Inspector concluded that the Nuclear Industry should not be given the go-ahead to begin their planned programme:

“in [their] current state of inadequate knowledge” (3)

CoRWM concluded in 2006 that these outstanding scientific issues had not been resolved. Thus in 2008, Dr Mortimer Lewis (of DEFRA) wrote: (4)

*“CoRWM also recommended that further research and development should be carried out aimed at reducing uncertainties as the process moves forward. **It is important to be clear that more work needs to be done**”*

Thus it may be seen that the problems identified in the 1990s Inquiry have still not been resolved.

Waste from new reactors.

The Government's 2008 White Paper states that

“... in the absence of any proposals from industry, the Government has concluded that any new nuclear power stations that might be built in the UK should proceed on the basis that spent fuel will not be reprocessed and that plans for, and financing of, waste management should proceed on this basis. We are not currently expecting any proposals to reprocess spent fuel from new nuclear power stations.” [p31]

This raises a whole new set of questions about the disposability of spent fuel from new reactors which have yet to be answered.

The NIA Application states that spent fuel could be stored at the reactor site until around 2090, but describes this as 'no significant detriment'. It also states that if the spent fuel were transported away this would result in around 100 transports over the 60 year life of the reactor, and that the additional waste from a 10GW(e) new nuclear programme could lead to an increase in the size of the repository of between 50 and 90% depending on assumptions made. (5)

There needs to be a far greater examination of the detrimental impact waste stores are likely to have on communities with new nuclear reactors over their 100 year life; about the impact of using new higher burn-up fuel with a higher levels of enrichment than has been used in the past; and the impact on the size, footprint, cost etc of the proposed geological disposal facility. (6)

The Government needs to organize, as recommended by CoRWM, a new consultation exercise on waste from new reactors, before agreeing to the NIA's Justification Application. This should include an open and transparent examination of every aspect of spent fuel storage on reactor sites, including, for example: the threat of a terrorist attack; the impact of waste from a new reactor programme on the proposed geological disposal facility; and the ethics of creating yet more dangerous nuclear waste when we are still not certain what to do with waste from existing reactors.

The Disposability of High Burn-Up Fuel

According to the NDA the dimensions of the underground disposal area are influenced by the heat output from the wastes at the time of disposal. This is because each disposal container has to have sufficient separation from adjacent containers to ensure that the temperatures of components in the isolating engineered barrier system stay below levels at which the components' performance might be compromised. (7)

It goes on to claim that...

"...the requirements for underground space for the disposal of spent fuel from the EPR or AP-1000 are thought likely to be broadly similar to those that would have been required for spent fuel used to generate an equivalent amount of electrical energy from an earlier design of pressurised water reactor."

This, however, fails to make clear that the space required for high burn up fuel will be much greater per tonne or per canister than for fuel 'burnt' to conventional levels.

The French EPR reactor will be more powerful than any other reactor in commercial use – but will use about 15% less uranium and produce 30% less waste. But information obtained by Greenpeace suggests it will be up to seven times more hazardous because more uranium is burned up. That will make it more expensive to handle and store safely. It will pose greater dangers to workers from higher radiation doses during transfer and storage and will need to be stored for longer in areas above ground, where it is potentially exposed to terrorists. This admission is made in an 'environmental impact assessment' report by Posiva – the company responsible for managing the waste which will be produced by the European Pressurised Reactor (EPR) currently being constructed in Olkiluoto, Finland. The amount of iodine-129 produced by the EPR is seven times as large as that of a current operating reactor. (8)

Spent nuclear fuel contains most of the radioactivity from the new reactors, but neither government nor its regulators have assessed its "disposability", or the health effects of managing it. The Nuclear Industry Association says a repository dealing with legacy wastes could readily accommodate the smaller volumes of easier-to-handle wastes from the new nuclear plants. But because the spent fuel from EDF's planned reactors in England will be hotter and more radioactive than waste from existing reactors, there are serious doubts about its disposability. Yet the NDA is keeping its assessments of this new waste secret. (9)

Spent Fuel Stores

At the Welsh Assembly Government Department for Environment, Sustainability and Housing Ministerial Policy Board meeting on 9th March 2009 the NDA was asked 'how much additional cooling is required for high burn-up spent fuel before disposal?' The reply was that an additional 50 years would be required – in other words 100 years in the onsite interim store.

The implications of this are profound, particularly in the light of recent revelations about new estimates of sea level rise.

Climate Scientists are now warning that rising sea levels pose a far greater danger than previously estimated. There is now a major risk that many coastal areas around the world will be inundated by the end of the century because Antarctic and Greenland ice sheets are melting faster than previously estimated. The International Panel on Climate Change (IPCC) - when it presented its most up-to-date report on the likely impact of global warming in 2007 - concluded that sea-level rises of between 20 and 60 centimetres would occur by 2100. Revisions now suggest sea-level rises could easily top a metre by 2100 - a figure that is backed by the US Geological Survey, which this

year warned that they could reach as much as 1.5 metres. The increasing possibility of severe storm surges will add to the vulnerability of several sites.

The Sizewell B nuclear plant on the Suffolk coast, for example, will certainly be affected by rising sea levels. If new reactors are built at Sizewell they would be expected to have a life of 60 years – taking us to about 2080. If spent fuel has to be stored on site for a further one hundred years, this could take us to 2180. By that time, who knows what sea-level rises and what kinds of inundations the country will be experiencing? (10)

Conclusions

There needs to be a far greater open and transparent examination of the issues raised by the production of waste by new nuclear reactors. Such an examination should include:-

- (1) A public assessment process which examines the social and ethical issues raised by the production of new waste as distinct from wastes already committed from the existing nuclear programme.
- (2) A full examination of the detriments likely to occur as a results of storing spent nuclear fuel on reactor sites for up to the next 160 years.
- (3) A full open and transparent examination of the disposability of spent fuel, including high burn-up spent fuel.
- (4) An examination of the impact of rising sea levels on spent fuel and nuclear waste stores.

(1) See CoRWM Statement, March 2006.

[http://www.corwm.org.uk/Pages/Archived%20Publications/Tier%202%20\(6\)%20-%20Reporting/Tier%203%20-%20Other%20reporting/1593%20-%20CoRWM%20statement%20on%20new%20nuclear%20build.pdf](http://www.corwm.org.uk/Pages/Archived%20Publications/Tier%202%20(6)%20-%20Reporting/Tier%203%20-%20Other%20reporting/1593%20-%20CoRWM%20statement%20on%20new%20nuclear%20build.pdf)

(2) Making Local Connections on a Global Threat, Publicservice.co.uk, October 20, 2008

http://www.publicservice.co.uk/feature_story.asp?id=10661&topic=

(3) McDonald (1997) Cumbria County Council: Appeal by UK Nirex Ltd, APP/H0900/A/94/247019. p277 para 8.56

(4) Letter to Dr Rachel Western – Nuclear Researcher for FoE Cumbria Groups.

(5) Nuclear Industry Association, Justification Application, Volume 1 Application (including additional information requested on behalf of the Justifying Authority). November 2008.

<http://www.berr.gov.uk/files/file49231.pdf> Paras 5.40 – 5.45

(6) See for example: Richards, H. Too Hot to Handle: The truth about high burn up fuel. April 10, 2008 <http://www.no2nuclearpower.org.uk/reports/TooHottoHandle.pdf> and Richard, H. Deep Repositories for Spent Fuel: Burying the Truth. March 29, 2008.

<http://www.no2nuclearpower.org.uk/reports/buryingthetruth08.pdf>

(7) Management of Wastes from New Nuclear Power Stations NDA Position Statement Dated Feb 24th 2009 Doc No RWMDPP01

<http://www.nda.gov.uk/documents/upload/RWMDPP01-Management-of-wastes-from-new-nuclear-power-stations-position-statement-February-2009-v1.pdf>

(8) See page 137, Posiva's Expansion of the Repository for Spent Nuclear Fuel, Environmental Impact Assessment Report (2008) and,

Technical Report 04-08, Nagra (2004).

http://www.nagra.ch/documents/database/dokumente/%24default/Default%20Folder/Publikationen/e_ntb04-08.pdf

(9) Letter from Hugh Richards to the Guardian 3rd Feb 2009

<http://www.guardian.co.uk/environment/2009/feb/03/1>

(10) McKie, R. Scientists to issue stark warning over dramatic new sea level figures, Observer, March 8, 2009 <http://www.guardian.co.uk/science/2009/mar/08/climate-change-flooding>