

Nuclear Free Local Authorities **RADIOACTIVE WASTE POLICY** Briefing on the Government Review

Radioactive Waste Briefing Number 20, August 20th 2009

NFLA Secretariat overview of the:

UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry: UK Nuclear Industry LLW Strategy.

Consultation Document – Published 5th June 2009.

Notes to NFLA member authorities:

This official consultation by the NDA is open until **11th September 2009**. The Nuclear Free Local Authorities response to the consultation forms the basis of this briefing, but additional background information is attached in grey boxes to allow member authorities to add in any additional local issues and concerns they would like to add in an individual response.

If you wish to submit an individual response then please send it to:

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Or Email it to: llwstrategy@nda.gov.uk

If you do send a local submission please copy it to the NFLA Secretariat – office@nuclearpolicy.info so that the Secretariat is aware of your response.

The response has been composed by the NFLA Scotland Policy Advisor, Pete Roche, with minor edits by the NFLA Secretary, Sean Morris.

1.0 Introduction and Background

The Government began a review of solid low level waste (LLW) management policy with stakeholder workshops in 2005 followed by a consultation document issued in February 2006. (1) This review paralleled and complemented the Committee on Radioactive Waste Management (CoRWM) review of the long term management of higher activity waste which reported to Ministers in July 2006.

The Nuclear Free Local Authorities (NFLA) and NFLA Scotland both responded to DEFRA's February 2006 consultation. (2)

The thrust of the Government's proposals was that a more flexible approach to the management of LLW was required, for example use of a wider range of waste

management options beyond engineered disposal. The Government said that about 2 million cubic metres (m³) of LLW could arise from existing nuclear and non-nuclear activities over the next century, including that which will arise from the decommissioning and clean-up of the UK's older, publicly owned, civil nuclear sites, by the Nuclear Decommissioning Authority (NDA). This compares with a remaining capacity for the currently authorised LLW repository (LLWR) site near the village of Drigg which was estimated to be about 0.8 million m³ (3).

The NFLA has been raising its concern that, given the large volumes of lower level wastes, there would probably be pressure to introduce unacceptable management techniques, since at least August 2004. (4) It suggested then there would be pressure to increase the amount of wastes going to landfill, as well as pressure to lower standards for site remediation in an attempt to reduce the volumes of waste generated and their associated disposal costs. With significant quantities of potentially valuable metals arising from decommissioning, there could also be pressure to allow increases in discharges of liquid radioactive waste into the marine environment, as a consequence of decontamination processes for metals earmarked for recycling.

In its response to the February 2006 consultation NFLA expressed concern that some options for LLW management could result in increased dilution and dispersal, increasing the potential for public exposures, and adding to the burden of radiological risk that is carried by society. It called for the application of the precautionary principle in setting demanding targets. (5) NFLA (Scotland) also expressed a worry that the emphasis on "flexibility" indicated DEFRA's intention that waste management should permit, and encourage, the dilution and dispersal of radioactive contamination throughout the environment, provided that projected dose and risk levels remain within certain parameters. (6)

Unfortunately neither NFLA nor NFLA (Scotland) appears on the list of consultees on DEFRA's website, (7) although one point made by the Government in its summary of comments may have been made in response to points made by the NFLA (8). A repeat of this situation must be avoided. There is not much point in developing waste management plans with "*appropriate stakeholder involvement*" (Defra policy document para 11) if stakeholder views appear to be ignored without explanation.

There are only two mentions of "dilute and disperse" in the Government response document (para 3.3) in a paragraph which is making the case for the use of incineration as a waste management tool. The NFLA (Scotland) response referred to the need to end the waste hierarchy at containment, not disposal. The Government response document says this would imply complete containment – taken to mean indefinite storage of all LLW – which "*is not a practical proposition*".

The Government also says:

"...the dilution of LLW and VLLW by large volumes of combustible non-radioactive waste at incinerators means that radioactivity that remains in the ash is effectively diluted into large volumes of ash which then go to landfill or in the case of material from lime scrubbers, for other uses. Recent radiological impact assessments have shown that the human health impacts of the disposal of relatively large volumes of VLLW to landfill are very low."

DEFRA published its finalised policy document in March 2007. (9) This refers (para.12 p7) to the principles that should guide the preparation of waste management plans, i.e. risk

informed approach; waste minimisation (by activity and by volume); consideration of all practical options; presumption towards early solutions; proximity; and consideration of future climate change impacts. (These are repeated in the NDA consultation document para 1.1.) But DEFRA did not see fit to mention the NFLA view that these principles should be applied with the environmental protection principle of '*concentrate and contain*', rather than '*dilute and disperse*', even though this principle has been accepted elsewhere by DEFRA. (10)

DEFRA's process, therefore, has failed to allay fears that the new low level waste management policy will permit, or even encourage, the dilution and dispersal of radioactive contamination throughout the environment, provided that projected dose and risk levels remain within certain parameters. Given the uncertainties now beginning to emerge surrounding the impact of low level radiation on health this is a very worrying development, and it will be up to the NDA in its LLW Strategy to address this issue.

1.1 Radiation and Health

For example, the Government's Committee Examining Radiation Risks of Internal Emitters (CERRIE), which reported in 2004, concluded that uncertainties about risks mean that in some cases we might be exposed to 10 times the risk previously thought. These uncertainties, said the Committee, require policy makers and regulators to adopt a precautionary approach when dealing with exposures to internal radiation. (11) CERRIE looked, in particular, at newly discovered effects of radiation such as genomic instability (ongoing, long-term increases in mutations within cells and their offspring), bystander effects (cells next to those irradiated are damaged) and minisatellite mutations (repeat DNA sequence mutations). Since 2004 these so called 'untargeted' effects have been described in more and more detail. This work has clearly resulted in a "paradigm shift" amongst scientists, and leads to the conclusion that a way of protecting those who are more radiosensitive than the average will have to be devised.

A major conclusion of the recent German KiKK study (12) is that the leukaemia risk near German Nuclear Power Stations casts "significant doubt" over the official doses received by people living nearby. (13)

1.2 Environmental Principles

DEFRA's June 2008 draft Statutory Guidance to the Environment Agency (14) sets out several environmental principles in paragraph 11 which the NFLA believes should underpin all radioactive waste management policy. The NDA LLW Strategy must make clear that, at the very least, it will operate according to these principles. They include:-

- the preferred use of concentrate and contain in the management of radioactive waste over dilute and disperse;
- the precautionary principle;
- the polluter pays principle; and
- sustainable development.

The overall guiding principle should be one of sustainability. Sustainability ultimately involves the elimination of human contribution to the progressive build-up of both substances extracted from the Earth's crust and substances produced by society. In other words, we should be aiming for a goal of zero discharges for all toxic/radioactive and/or persistent or bio-accumulative substances. Any release of such substances is likely to

compromise the ability of future generations to satisfy basic needs and enjoy a better quality of life. (15)

1.3 Aiming for zero

This means low level waste policy should be about limiting and restricting discharges and dispersal of radioactivity into the environment. As a general principle we should aim for a goal of zero discharges. If there are cases where, as the Government claims, complete containment is not a *'practical proposition'* because of practices which have been carried out in the past and legacy wastes which have been stockpiled, then the waste producers need to make the case for an exception to be made.

2.0 The NDA Consultation

The Nuclear Decommissioning Authority's (NDA's) consultation on its proposed strategy on solid LLW waste management is in response to DEFRA's finalised policy document. (16) Again this document sets out a framework for the flexible management of LLW, and argues that earlier policy did not cover large scale decommissioning and site restoration and that waste management options beyond engineered disposal will be critical. The framework allows for development of solutions on a case-by-case basis. **If previous policy is not fit-for-purpose the NDA needs to make clear that its new framework will meet the environmental principles set out above.**

The NDA now says 3 million m³ of LLW are expected to arise over the next 120 years (up from 2 million). But the LLWR's estimated capacity has gone down to around 0.7 million m³, so a new repository will be required around 2037. New nuclear build has not been included in these figures. The NDA says its proposed strategy will provide the required capacity by (a) the application of the waste management hierarchy; (b) best use of existing facilities; and (c) development of new management and disposal routes.

LLW Strategy Group

LLW Repository Ltd is operated by UK Nuclear Waste Management Ltd (UKNWM Ltd) which is a consortium led by URS Corporation -Washington Division, with Studsvik UK, Serco and Areva. It took over responsibility for the LLWR Site near Drigg from BNFL on 1st April 2008. (17) Working in partnership with the NDA, LLW Repository Ltd has established the National Low Level Waste Strategy Group. This group, mainly made up of industry representatives and regulators, also includes representation from local authorities – NuLeaf (Nuclear Legacy Advisory Forum) and SCCORS (Scottish Councils Committee on Radioactive Substances). (18)

Waste Quantities

NDA sites are expected to generate 80% of LLW from the nuclear industry.

Sellafield generates 60% of LLW from the nuclear industry.

LLW average arisings amount to 25,000 m³ per year. (According to LLWR Ltd – 1m³ = 1 tonne roughly)

In terms of volume, the NDA says two LLW types that stand out are metal (37% of the inventory) and soil / rubble (33% of the inventory). For VLLW, the same two waste streams dominate; soil and rubble account for 63% of VLLW, metal accounts for 23%.

The LLW Strategic Review, produced by LLW Repository Ltd., says that approximately 60% of the 3 million m³ of LLW expected to arise over the next 120 years is high volume VLLW (Very Low Level Waste). (19) For the majority of sites most of this waste is currently sent to the LLWR. A smaller on-site disposal facility for LLW and VLLW is to be built at Dounreay. A commercial landfill facility at Clifton Marsh is able to accept relatively significant quantities of VLLW (and small quantities of LLW) from Springfields and Capenhurst. There are also a small number of other landfills around the UK able to accept small quantities of VLLW from nuclear and non-nuclear industry sites.

VLLW from the two nuclear sites operated by Rolls Royce in Derby was sent to Hilts Quarry, in Derbyshire, until October 2002, when the practice was ended due to public opposition. (20) Amersham plc and Devonport Royal Dockyard are also authorised to send small amounts of VLLW to burial at other sites. The 1995 Review of Radioactive Waste Management decided not to encourage greater use of landfill because of opposition from local authorities and the public. (21) The Environment Agencies (EA and SEPA) have indicated an unwillingness to allow this practice to be extended. Clive Williams of the Environment Agency told the Local Government Association Special Interest Group on Radioactive Waste Management & Nuclear Decommissioning (now NuLeaf) in May 2004 that:

"The Agency's current policy is that this route will be used only for those nuclear sites which are already authorised for disposal of VLLW – there is no intention to offer this as a new disposal route for other nuclear sites ... Any nuclear site application for a new disposal route, such as VLLW to landfill, would need to be subject to public consultation."

Despite this, according to the LLW Strategic Review, a number of sites are considering opportunities to dispose of waste to facilities other than LLWR near Drigg. (Recent press reports suggest that Cumbria County Council is expected to refuse permission for low level waste disposal at Lillyhall and Keekle Head on the grounds that it does not want to see a proliferation of nuclear waste disposal sites. "It should not be put in holes and imposed on people around West Cumbria."(22))

The NFLA would be concerned about any expansion in the use of landfill.

2.1 Principles

The NDA document sets out a number of key principles which include that there should be effective characterisation and segregation of waste to facilitate flexible management, and given the diverse physical, chemical and radiological nature of LLW, it is important to have a variety of proportionately regulated waste management routes. As well as health, safety, security, and environmental excellence, it also says public acceptability is vital to the development of appropriate waste management plans and that the development of new waste routes will require early and proactive engagement with stakeholders.

3.0 NFLA Response to NDA's consultation questions

The NDA proposes to reduce the amount of waste being consigned to the LLWR by applying the waste management hierarchy. At the top of the hierarchy is waste avoidance and characterisation. The NDA says it can be demonstrated that a significant portion of LLW arisings are, in fact, exempt from regulation under the Radioactive Substances Act 1993 because of the "insignificant hazard" they present and can therefore be safely excluded from the LLW inventory. The NDA suggests standardizing characterization, sorting, and segregation procedures across nuclear sites.

Question 1 – Do you agree with the proposed approach to avoidance and characterisation of waste? What are the most important areas for work and are there other actions that could be undertaken?

Provided there can be guarantees that the wrong kind of waste won't end up in the exempt category, and that there is not a big push to widen the parameters covered by exempt waste, this appears to be reasonable way forward. However just because the waste can be classified as exempt does not exempt the waste producer from consulting the public. There is a legacy of public mistrust in the industry that has to be overcome before even 'clean' waste can be exported from a nuclear licensed site for disposal. For example, in August 2003 public opposition prevented the UKAEA disposing of 'exempt' waste from Dounreay at a landfill site in Falkirk. (23) This could possibly be overcome by the establishment of an independent 'verification' agency which included representatives of the local community. The agency would verify that the waste was what the nuclear site operator claimed it was and did not contain radioactivity above agreed levels.

Question 2 – Re-use and recycling of waste from the nuclear industry could yield significant benefits – do you agree with this approach and where do you see the significant opportunities for implementing the option?

According to the NDA, it has previously been considered that opportunities to apply the next level of the waste hierarchy – re-use and recycle - to radioactive waste were limited, but suggests that, with new decontamination techniques, this could change. Removing surface contamination from concrete and decontaminating metal are mentioned as ways of reducing LLW. The use of high pressure water jets, shot blasting, acid baths and machining and grinding equipment are highlighted as techniques used in conventional waste management. The NDA mentions production of secondary waste as a potential drawback.

Clearly these techniques all raise the possibility of an increase in liquid and particulate radioactive discharges to the environment, in breach of the concentrate and contain principle. Nuclear decommissioning must not become an excuse for increasing discharges to the environment.

As NuLeaf also highlights, the "*undesirable dispersal of radioactive materials throughout society*" is a possible consequence of the recycling of contaminated metals. There needs to be very strict standards implemented before declaring metals suitable for free release.

Question 3 – To what extent do you believe that compaction still has a key role to play in the optimisation of LLW management? What are the opportunities for improving the use of compaction?

NFLA would support the further use of compaction.

Question 4 – Do you agree that the benefits of metal treatment outweigh the detriments? If not, why not? If metal treatment costs more than disposal to implement, is this acceptable?

The NDA says treatment routes for LLW should be utilised to ensure optimum use of the existing national disposal facility and where demonstrated as BPEO (Best Practicable Environmental Option). It goes on to say that waste should be cleaned, treated, recycled and / or exempted before disposal decisions are made. Metal decontamination/ smelting and incineration should be pursued to the maximum extent.

Unless and until the NDA commits itself to the environmental principles discussed above it is difficult to see this statement as anything other than a call to be allowed to increase discharges of radioactivity into the environment in order to reduce the amount of waste being consigned to the LLWR. Cleaning, treatment, recycling and exemption all need to demonstrate they can be carried out in accordance with environmental principles – in particular the concentrate and contain principle.

The cost of metal treatment should not be an overriding consideration. If there is insufficient space in the LLWR for existing waste then clearly alternative proposals need to be brought forward. However, as NuLeaf points out, the consultation document lacks any information about what the detriments of metal treatment might be.

Question 5 – Do you agree with the proposals set out for thermal treatment? If not, why not? As incineration is often a controversial approach, what should be the key message if the LLW strategy were to actively promote the use of this technology?

As stated above NFLA is not in favour of treatments which result in an increase in radioactive discharges – in the case of incineration either through the stack or by land-filling ash. Public opposition has generally prevented the expansion of incineration as a waste management technique, most recently NFLA member authority, Shetland Islands Council, has campaigned against the use of incineration at Dounreay. The NDA's commitment to clear and effective involvement of communities at an early stage when developments are planned is therefore welcome.

Question 6 – We believe that the majority of waste management solutions that are required to implement this strategy are or will be available, either in the nuclear estate or through the supply chain and therefore should be used in preference to centralised investment in new infrastructure. To what extent do you agree with this statement?

An important principle is that waste should be treated at or close to the site of production – the proximity principle. NFLA would not be in favour of waste being transported around the country because different sites have particular facilities for treating different types of waste.

Question 7 – Do you agree with the approaches set out above for the development of an optimised approach to management of LLWR?

Agreement with the approach to optimising use of the LLWR depends on what happens to waste which is diverted from the repository. Alternative waste management options should only be permitted if they adhere to the environmental principles. This effectively

means ruling out any techniques which increase discharges of radioactivity into the environment.

Question 8 – What are the key considerations that should influence the development of new packaging solutions for LLW management?

As stated, new packaging solutions must not compromise the environmental safety case.

Question 9 – The impacts of the transport of LLW are limited when compared to transport of other materials, when considered at a national level. However, it is a very significant issue for local communities where the transport is taking place. How do you think this should be factored in to national strategy?

Question 10 – To what extent does a movement of waste from road to rail for transport represent a significant improvement? Do you see any disadvantages to this approach?

By implementing the proximity principle where possible and properly consulting communities affected problems can be avoided. Rail transport is preferable to road transport for climate and congestion reasons. It should be noted that the proximity principle is not just about avoiding transportation – it is also about communities that have benefited from the waste producing activity taking responsibility for the results of that activity. (24)

Question 11 – Government's policy for the management of LLW indicates that landfill disposal of LLW and VLLW should be considered when determining end points for these wastes. What do you think should be the key considerations when comparing landfill disposal with other options such as LLWR, new vaulted disposal routes, etc?

The NDA quite rightly points out that the development of new waste management routes has the potential to be controversial. It says issues of public acceptability will be considered. It must, however, recognize that many proposals may fail. Clearly with legacy waste from existing nuclear facilities there are now limited opportunities to prevent waste being created. However, this is not the case with proposed new nuclear reactors. NDA should, therefore, make representations to the Government about the need to finalise LLW management options before proceeding with new nuclear facilities.

In comparing landfill options with the LLWR, public acceptability and whether landfill results in increased dilution and dispersal, and adds to the public's burden of radiological risks, need to be taken into account. The precautionary principle should be applied.

Question 12 – To what extent do you agree with the key considerations set out above for on-site disposal proposals?

NFLA tend to agree with the NuLeAF contention that the SEA conclusions on this issue are unduly negative, and that there can be significant benefits from 'on or adjacent to site' waste management (compared with, for example, the use of off-site landfill). However NFLA dislikes the use of the word 'disposal'. This is not simply a question of being pedantic. The dictionary definition of disposal is "the act or means of getting rid of something". On-site disposal does not 'get rid' of the waste, it merely dilutes and disperses it around the environment.

If on-site waste management means the development of purpose-designed facilities under the supervision of nuclear site management then this could be acceptable.

Question 13 – Do you agree with the approaches set out for encouraging the right behaviour? To what extent do you think that waste recycling targets could have benefit to the national strategy? What potential benefits and difficulties would you envisage from implementing such approaches?

NFLA agrees with the submission to this consultation made by NuLeaf on the importance of public consultation and the engagement of local stakeholders so they fully understand the challenges, are able to participate in option assessments. The NDA needs to encourage waste producers to fully support its agenda with regard to proper open and transparent consultation.

Question 14 – To what extent do you agree with the risks and mitigation set out here?

The proposed strategy relies heavily on the achievement of public acceptability. As indicated by CoRWM with regard to higher level wastes, public acceptability is made less likely by the introduction of the possibility of a new reactors construction programme because there is no longer a boundary around the quantity of waste which any given nuclear waste facility might be required to accept. (25)

One way of interpreting the current situation might be as follows: disposal of low level waste at the LLWR near Drigg is expensive. In order to reduce costs and avoid the need to search for a new LLWR site at the current time just as a new nuclear programme is getting off the ground (a decision on launching a search has been delayed until 2016) the government and industry need to come up with proposals for the dispersal of waste around the country by stealth so as not to attract too much attention. Environmental NGOs are currently pre-occupied with new build proposals, so hopefully it will be possible to get away with earlier proposals such as sending more waste to landfill; building new incinerators and recycling contaminated metals because their attention will be elsewhere. This process can also be assisted by tweaking exemption orders so that more waste can be disposed of as 'clean'.

Conclusion

There is a legacy of public mistrust in the industry which needs to be overcome in order to implement any kind of LLW strategy. A couple of badly presented proposals being taken forward at the same time could easily lead to the above interpretation taking root across a large section of society. A search for a new LLWR site could, for example, generate a great deal of public anger if it begins after new reactor construction has already started.

In the view of NFLAs the legacy of mistrust can only be overcome by underpinning any proposed strategy with a clear set of environmental principles; setting a boundary on the amount of waste to be dealt with – in other words cancelling proposals for new reactors; and extensive consultation in an open and transparent manner.

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