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To whom it may concern,

NUCLEAR FREE LOCAL AUTHORITIES SUBMISSION TO THE DECC CONSULTATION ON LONG-TERM MANAGEMENT OF THE UK'S PLUTONIUM STOCKS

I attach the formal submission from the UK and Ireland Nuclear Free Local Authorities (NFLA) to the DECC consultation on the long-term management of plutonium.

Information on the NFLA and its view on this consultation

The NFLA are a local authority organisation made up of members in England, Scotland, Wales, Northern Ireland and the Republic of Ireland which seek to tackle in practical ways, and within their powers, the problems posed by civil and military nuclear hazards. As the local government voice on nuclear issues, the NFLA aims to:

- Increase local accountability over national nuclear policy;
- Identify the impact of national nuclear policy on local communities;
- Work to minimise nuclear hazards and increase public safety.

Further information on its work can be found at its website <http://www.nuclearpolicy.info>.

The NFLA has been actively involved throughout the consultation process on long-term management of the UK's plutonium stockpile. It responded previously to the NDA's credible options paper on plutonium management, attended the DECC organised stakeholder event in Manchester and issued formal submissions to DECC's pre-consultation discussion papers, which are attached as Appendix 1 and Appendix 2 below, and which are part of the NFLA's formal submission to this consultation. DECC will therefore be unsurprised that the NFLA strongly disagrees with the Government's preliminary preferred policy view that the plutonium stock at Sellafield (and Dounreay) should be fabricated in a new facility into mixed uranium and plutonium oxide fuel. As the NFLA has consistently argued for, its own view is that the plutonium should be treated as a waste and completely immobilised. All options should still be investigated for now though. Further information in support of the NFLA view, and in answer to the consultation, follows below.

However, given that there is a major ongoing incident in Fukushima Daiichi nuclear power plant in Japan – reactor number 3 at the plant uses Mox fuel – and there is a national nuclear safety review being currently undertaken by Chief Nuclear Inspector Mike Weightman, it is the clear view of the NFLA that **this consultation should be formally withdrawn by DECC until the learning points and outcomes of this disaster are fully known**. The NFLA response should therefore be read within this context.

Q1. Do you agree that it is not realistic for the UK Government to wait until fast-breeder technology is commercially available before taking a decision on how to manage plutonium stocks?

Yes. A decision on management of the UK's plutonium stocks should be made within a contemporary timeframe and not put off indefinitely, as it has been for several decades already. The NFLA though does not agree with the implication of this question to develop fast-breeder technology in order to commercially reprocess plutonium stocks in the UK.

The NFLA notes that the UK plutonium stockpile will grow to around 112 tonnes at the end of the currently planned reprocessing operations – 110 tonnes is at Sellafield and 2 tonnes at Dounreay. This is the largest civil plutonium stockpile anywhere in the world.

Plutonium separation originally began for the purpose of building nuclear weapons. Later because uranium resources were known to be limited, fast reactors, fuelled by plutonium, were thought to be the way forward. These reactors can theoretically, at the same time as generating electricity, convert non-fissile (the useless portion of) uranium into more fissile plutonium. However, the NFLA notes a string of problems have all come together to stop the development and construction of commercial scale fast reactors.

One major difficulty is that they use liquid metal as a coolant – usually liquid sodium, which explodes on contact with air. Currently, only one commercial fast reactor is operating—the Beloyarsk BN-600 in Russia. India is only intermittently operating its Fast Breeder Test Reactor (FBTR) at Kalpakkam. The UK has closed down its Prototype Fast Reactor at Dounreay. The French closed down their Superphénix Fast Reactor in 1996 after it had achieved an average capacity factor of less than 7% over eleven years' of operation. Japan's fast reactor has been shut since a leak of liquid sodium coolant in 1995 and the Fukushima incident is only likely to put a major question mark over the entire Japanese nuclear programme. (1)

In the absence of fast reactors, several countries, such as Germany, France and Switzerland, opted to use their plutonium stockpiles in conventional reactors. However this route for making use of the plutonium stockpile is problematic in the UK because of the type of reactors built here. In the absence of the capability to use plutonium in either conventional or fast reactors separated plutonium has accumulated. This huge policy mistake has left the UK with a much greater dilemma than any other nuclear state. The NFLA believes this mistake should not be compounded by making an even greater mistake in building a new MOX fabrication facility to deal with the UK's plutonium stockpile.

The NFLA have consistently argued as well that separation of plutonium from spent nuclear waste fuel – known as reprocessing – is completely unnecessary. Only around 5 – 10-% of the world's spent fuel arisings are submitted for reprocessing, the rest is stored. (2)

Q2. Do you agree that the UK Government has got to the point where a strategic sift of options can be taken?

The NFLA believes it is essential not to rush this decision and that further research should be taken over the next few years by the NDA to research the immobilisation and other options in coming to a final view. The NFLA though does believe that a decision in principle can be taken on the future direction of plutonium policy.

In its response to DECC's pre-consultation discussion papers on plutonium management, the NFLA analysed the three main options and advocated an incremental approach coupled with extensive stakeholder engagement on such a sensitive policy area. Our updated overview of those three options is as follows:

- **Reuse.** This is the Government's preferred preliminary option and the conversion of the existing stockpile of UK plutonium to Mixed Oxide (MoX) Fuel would require the construction of a new MoX fuel fabrication plant. In the NFLA's view, this would **not** be an economic use of

resources and there are many other more efficient climate abatement options. Spent MoX fuel would be a much more hazardous waste form to deal with than conventional spent fuel. Furthermore, the use of MoX fuels rather than as a waste product would mean that the UK fails to meet its non-proliferation objectives. It also involves quite unacceptable safety and security risks. The NFLA also perceives a potential threat to civil liberties, as it does not want to see large armed plutonium waste convoys being transported up and down the country between Sellafield and potential new MoX burning reactors. Such transports also lead to inevitable concerns over emergency planning and the potential for a malicious attack.

The Government concedes in the consultation that development of a new MOX plant for reprocessing plutonium does not have a positive economic benefit. The NFLA agrees with this assessment and feels it is therefore foolhardy to spending at least £500 million on developing this option. To build such a plant also would require a large government subsidy, and the NFLA feels this again breaks the Government's coalition agreement of no public subsidies for nuclear new build facilities, which this effectively would be.

- **Immobilise and treat as waste.** This option remains the **NFLA's preferred option**. Unwanted plutonium should be blended down or otherwise immobilised and managed as waste. The material should remain under international safeguards until it can be shown that it would be impossible to reuse it. All immobilisation options mentioned in the Nuclear Decommissioning Authority's (NDA) updated plutonium credible options paper should be investigated further and tested against environmental principles, including in particular proliferation resistance, and other criteria such as cost, dose levels to the workforce and the highest levels of health and safety. The NFLA acknowledges the difficulties for DECC and the NDA in this option, but feel that it is the most sensible, safest and practical choice available.
- **Indefinite storage.** The NFLA accepts that there is a need to store plutonium stocks securely in the interim period before it can be treated as waste, and accepts the consultation paper's assessment of the difficulties in doing this. The NFLA though notes that the NDA's credible options paper plans for storage of plutonium at the Sellafield site until 2120, which gives adequate time to develop and improve waste treatment strategy. The NFLA believes that indefinite storage is not suitable as a long-term option, and that plutonium stocks should be placed beyond any possible future use, which could potentially include use as a fissile material in the production of nuclear weapons. The NFLA also believes that the creation of further plutonium stocks should be ceased as quickly as possible.

Q3. Are the conditions that a preferred option must in due course meet, the right ones?

The conditions set out in the consultation are sensible criteria for selecting a preferred option. The NFLA would expect much greater detail on the standards required to fulfil each condition in a future consultation.

Members of the NFLA have also been involved in the development of the Nuclear Legacy Advisory Forum's (NuLeAF) submission to DECC on this consultation. The NFLA particularly supports their submission of a further condition on the Government for determining its final option for plutonium management. This is that the preferred option be "capable of inspiring public confidence". The UK Government will note that this was the formulation set in CoRWM's original terms of reference for consideration of long-term management options for higher activity wastes. Determining how public confidence will be judged is also a matter DECC will need to consider carefully through the organising of stakeholder workshops with interested groups and the general public.

In this context, the NFLA also strongly agrees with the NuLeAF submission that: "Government give closer consideration to the pros and cons of moving forward more promptly with the immobilisation of that proportion of the plutonium stockpile that is unlikely to be reusable as a reactor fuel." (3)

As noted in the NFLA's responses to the pre-consultation discussion papers, a central condition to determine a preferred option is intergenerational equity. As the NFLA commented then:

"Any management option selected will have potential costs to future generations, who will not benefit from our generation's use of plutonium in the way that we have. As far as possible the legacy costs of managing plutonium should be paid up-front, rather than passed on to future generations." (4)

Q4. Is the UK Government doing the right thing be taking a preliminary policy view and setting out a strategic direction in these areas now?

The NFLA believes the UK Government is correct in setting a general policy direction in plutonium policy (as long as the caveats noted above in questions 2 and 3 above are considered), but that it should not be taking a preliminary policy view until further research is made on the options and extensive stakeholder engagement is undertaken. Adequate time should be given to develop the available options and the plutonium should be kept in safe and secure storage facilities in the meantime.

Q5. Is there any other evidence the UK Government should consider in coming to a preliminary view?

The NFLA is very disappointed that the UK Government has come to a preliminary policy view on long-term plutonium management at this stage of the process. The NFLA believes there is substantial contrary evidence including the performance of the existing facilities, the cost of new facilities, concerns over proliferation and issues around waste disposal. The NFLA responded in detail in the pre-consultation discussion papers that all options should continue to be considered by stakeholder engagement and finds it very frustrating that the Government has simply moved from those papers to give a preliminary policy view without adequately considering the veracity of other options.

The NFLA also finds it quite staggering that the Government has come to the view that a new fuel fabrication plant at Sellafield is the most effective long-term management for the UK's weapons-usable plutonium stock given the shocking failures of the existing reprocessing facilities.

The UK's Sellafield Mixed-Oxide (MOX) Plant is "*one of the most embarrassing failures in British industrial history*," according to a leaked US embassy cable. (5) It was built at a cost of £473 million, and despite repeated warnings that it would be uneconomic and could be a security risk, it has never worked properly. Even though the Government wrote off its capital cost, it is still haemorrhaging money. Though the annual loss is kept secret, the cable – released by WikiLeaks – says it is "*costing taxpayers £90 million a year*".

According to '*The Independent*', the Sellafield MOX plant is due to be kept open until the end of the decade, which means the enterprise will have cost the taxpayer a total of almost £2.5bn. (£900m operating costs so far and another £900m before it closes.) (6)

The THORP facility, which has been a major contributor to the UK's embarrassing plutonium stockpile has not performed much better. THORP reprocessed only 5000 tonnes of spent fuel in its first decade of operation, compared with a target of 7,000. Since 2005 the plant has been plagued with problems. What makes DECC believe we can get it right a third time?

In fact the Government's preferred option is based on the assumption that the UK doesn't make the same mistakes with a second MoX fuel fabrication facility, especially if it brings in the French, who already have a working Mox plant. But experience in the United States, where Areva is building a Mox plant, reportedly costing five times as much as anticipated and hopelessly behind schedule, does not bode well for the future. The American plant has no customers after Duke Energy withdrew test assemblies from its reactor because of poor performance. (7)

Proliferation concerns

The UK Government argues that expanded access to nuclear power needs to be managed so that it does not risk further proliferation of nuclear weapons. (para 2.1) Yet, if its preferred option for plutonium management does “demonstrate leadership” (para 2.4), as the Government says it wants, it will be demonstrating leadership in plutonium separation and transporting weapons-useable material around the UK.

Before Fukushima over 45 countries were considering embarking on a nuclear programme:

- Power reactors under construction: Iran.
- Contracts signed, legal and regulatory infrastructure well-developed: UAE, Turkey.
- Committed plans, legal and regulatory infrastructure developing: Vietnam, Jordan, Italy.
- Well-developed plans but commitment pending: Thailand, Indonesia, Egypt, Kazakhstan, Poland, Belarus, Lithuania, Chile.
- Developing plans: Saudi Arabia, Israel, Nigeria, Malaysia, Bangladesh, Morocco, Kuwait.
- Discussion as serious policy option: Namibia, Kenya, Mongolia, Philippines, Singapore, Albania, Serbia, Croatia, Estonia & Latvia, Libya, Algeria, Azerbaijan, Sri Lanka, Tunisia, Syria, Qatar, Sudan, Venezuela. (8)

It should be noted that since Fukushima a number of them are understandably reviewing these decisions.

A global expansion of nuclear power will require a proportional expansion of uranium enrichment capacity, and probably lead to an expansion of spent fuel reprocessing too. The diffusion of knowledge and the increase in global trade of the specialised materials and equipment needed to build and operate uranium enrichment facilities and reprocessing plants would make it more difficult to detect clandestine weapons programmes.

At least half a dozen countries have also said that they are specifically planning to conduct enrichment or reprocessing of nuclear fuel, a prospect that could dramatically expand the global supply of weapons-useable plutonium and enriched uranium. (9)

According to ISIS, thirteen of the forty countries are in the Middle East, and may be planning nuclear programmes as a way of countering Iran's programme, thus raising concerns about a Middle East arms race. (10)

If a new plant is built it will mean removing weapons-useable plutonium from closely guarded stores and transporting it around the country. It is relatively easy to remove plutonium from MoX fuel, so if terrorists or criminals intercepted a shipment, they could use it to make a bomb capable of destroying much of a major city. (11)

Waste disposal issues

At the recent Committee on Radioactive Waste Management meeting in Manchester (February 8th and 9th) the value of deciding **now** on options for plutonium was questioned. The lack of work on the disposal of spent MoX fuel was highlighted and it was suggested that such spent fuel may require cooling for up to 150 years before it could be disposed of. Spent MoX fuel could, therefore have a very significant impact on the size of the proposed underground waste repository (referred to by DECC and the NDA as a Geological Disposal Facility) footprint. According to 'The Independent' the Massachusetts Institute of Technology has found that spent Mox fuel takes about seven times as much disposal space compared to spent uranium fuel. (12)

Even if most of the UK's stockpile of plutonium is used for MoX fuel, there will still be plutonium that needs to be disposed of. Consequently issues concerning the disposal of plutonium in a deep-waste repository – a concept which the NFLA has deep reservations with - will still have to be dealt with.

Spent MOX fuel is also much more radioactive because it contains on average five times more plutonium than spent uranium oxide fuel. After 10 years, the heat generation from spent MOX fuel is twice as high as that of spent uranium fuel. After 100 years, it is three times higher. Given the very long half-life of Pu-242 (380,000 years), and Neptunium-237 (2.14 million years), it is much more complicated to store MOX than normal spent fuel. Instead of partially solving our high level waste problem, MOX creates even bigger waste problems: it needs more and longer cooling; it has to be stored much longer; it is more dangerous; and the costs are therefore significantly higher.

The Fukushima accident in Japan and plutonium management

The implications of the accident at the Fukushima Daiichi nuclear plant, where MoX fuel had been used in reactor 3, have yet to be analysed. The Convention on Nuclear Safety, to which 72 countries have signed up, will not meet until August 2012 to review the breakdown of safety systems at Fukushima, because the lessons-learned process cannot be completed "*until sufficient additional information is known and fully analyzed.*" (13) It seems foolhardy to the NFLA for the UK Government to be contemplating building such a facility until after such learning points are known – indeed it is a signatory to the Convention, so why is it going against this policy by continuing to seek development of new nuclear facilities?

OSPAR Commission policy commitments

The NFLA was present – on behalf of the local authority marine pollution group KIMO – at the recent OSPAR Commission Radiation Substances Committee. At the meeting it was reported that radioactive discharges into the OSPAR area had increased, and these were due to increases from reprocessing at the Sellafield facility. Such increases were also expected for the next few years, putting seriously at question the UK Government's commitment to reduce such discharges to 'close to zero' by 2020. The NFLA remains concerned that the development of a new MOX fabrication facility at Sellafield would exacerbate this problem and lead to potential disputes with the Irish and Norwegian governments, who remain concerned at any new developments at the Sellafield plant.

Q6. Has the UK Government selected the right preliminary view?

Given the comments made in question 5, the NFLA believes the UK Government has not selected the right preliminary policy view.

The NFLA's preferred policy view, as it has consistently made throughout this flawed policy consultation process, is that plutonium should be immobilised and treated as a waste whilst further research is undertaken in this area over the next decade. The existing stockpile should be stored safely for now, as the NDA has acknowledged. Seeking to develop a new MOX fabrication facility to suit the interests of the nuclear industry appears policy short-termism and inherently risky, as well as a highly expensive option, given the experience in the United States noted above.

Q7. Are there any other high-level options that the UK Government should consider for long-term management of plutonium?

Please see the NFLA responses in questions 2 and 3.

Summary of the key elements of the NFLA to this submission:

The key elements of this submission by the NFLA are as follows:

- The Government should withdraw this submission until the Weightman nuclear safety review and the full learning points from the Fukushima incident are known.
- In this context, and in reference to the Government's preliminary policy view to establish a new MOX fuel fabrication facility, the NFLA fundamentally disagrees with this policy view.
- The NFLA believe immobilisation of the plutonium and its treatment as a waste is the most sensible policy view for the Government to take forward.
- The creation of further plutonium stocks should be stopped as quickly as possible.

- Converting the existing stockpile of UK plutonium to MoX fuel would require the construction of a new MoX fuel fabrication plant. This would not be an economic use of resources and there are many other more efficient climate abatement options.
- The use of MoX fuel fails to meet non-proliferation objectives; involves unacceptable safety and security risks, and is a threat to civil liberties. Spent MoX fuel would be a much more hazardous waste form to deal with than conventional spent fuel.
- Selling plutonium to overseas customers, either in the form of MoX or plutonium oxide also fails to meet non-proliferation objectives. In addition to posing a threat of proliferation at the state level, MoX-fuel and plutonium commerce also poses a risk of theft or diversion by criminal organizations or terrorist groups. Anything which would legitimize plutonium commerce must be rejected.
- All immobilization options mentioned in the NDA's earlier credible options paper should be investigated further and tested against environmental principles, including in particular proliferation resistance, and other criteria such as cost, dose levels to the work force and so on. All this work should be conducted using a clear set of environmental principles.
- Developing a new MOX fabrication facility further threatens the UK's commitments under the OSPAR Treaty and should therefore be avoided for this reason alone.

If you have any queries with any part of this submission then please contact the NFLA Secretary, Sean Morris, using the details at the top of this letter, or by directly emailing him on

Yours sincerely,

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