



**UK Strategy for Radioactive Discharges 2006 – 2030:**  
**Consultation Response by Nuclear Free Local Authorities (Scotland)**  
**(including comment on the consultation on the Statutory Guidance to the Environment Agency)**

**1.0 Introduction**

The UK Government agreed, at the 1998 Ministerial meeting of the Oslo and Paris (OSPAR) Commission - the treaty for the protection of the marine environment of the North-east Atlantic - to achieve “*substantial reductions or elimination of discharges*” by the year 2020, “*to levels ...close to zero*”.<sup>1</sup> But it now looks as though the Government is reneging on its commitments.

The UK Government published a Strategy for Radioactive Discharges 2001-2020 in July 2002, as a response to its OSPAR commitments.<sup>2</sup> Now the Department of Environment, Food and Rural Affairs (DEFRA) (and the devolved administrations) have launched a consultation on a revised strategy for 2006 – 2030.<sup>3</sup>

Also issued in 2001 was a draft Statutory Guidance to the Environment Agency on Radioactive Discharges, but this was never finalised.<sup>4</sup> It said any proposed increase in discharges of radioactivity into the environment should only be considered in exceptional circumstances. It is understood this draft Guidance was severely criticised by the nuclear industry. It has been replaced by a new draft Statutory Guidance which is currently out for consultation.<sup>5</sup>

**1.1 2002 Strategy**

The 2002 Strategy said the Government would review it about every four years. The first draft for consultation was issued in June 2000, so this latest consultation is around four years late.

The 2002 Strategy document only covered liquid discharges. As promised this second draft Strategy covers aerial discharges as well as liquid discharges. This is to be welcomed.

Perhaps the most worrying aspect of the 2008 draft Strategy is that, whereas the 2002 discharges strategy was written in the context of a declining UK nuclear industry, this new draft allows for an expansion of the industry, and, for a host of reasons, allows for the failure to close some of the most polluting facilities in the

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<sup>1</sup> The Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic, Comprising the European Commission and 15 European nations including the UK. Ministerial meetings take place every 5 years, the 1998 meeting held in Sintra, Portugal. <http://www.ospar.org>

<sup>2</sup> [http://www.defra.gov.uk/environment/radioactivity/government/discharges/pdf/rad\\_dischargestrat1.pdf](http://www.defra.gov.uk/environment/radioactivity/government/discharges/pdf/rad_dischargestrat1.pdf)

<sup>3</sup> See <http://www.defra.gov.uk/corporate/consult/raddischarges-ukstrategy/index.htm>

<sup>4</sup> The industry is thought to have objected strongly to parts of this Guidance e.g. “The principle of progressive reduction is a central tenet of the way in which radioactive discharges should be controlled”.

[http://www.defra.gov.uk/environment/radioactivity/government/discharges/pdf/environment\\_consult\\_radioactivity\\_discharge\\_nls.pdf](http://www.defra.gov.uk/environment/radioactivity/government/discharges/pdf/environment_consult_radioactivity_discharge_nls.pdf)

The industry is thought to have objected strongly to some parts of this Guidance such as the idea that “The principle of progressive reduction is a central tenet of the way in which radioactive discharges should be controlled”.

<sup>5</sup> Consultation on the Statutory Guidance to the Environment Agency concerning the regulation of radioactive discharges into the environment. DEFRA, June 2008 <http://www.defra.gov.uk/corporate/consult/rad-discharges-eaguidance/consultation-doc-statutory-guide.pdf>

UK according to the schedule set out in the 2002 Strategy. It is extremely unlikely, therefore, that this revised strategy will be able to deliver the UK's commitments to OSPAR, unless there is a very lax interpretation of those commitments.

## 1.2 OSPAR Objective

The objective of the OSPAR Strategy includes “...*progressive and substantial reductions of discharges, emissions and losses of radioactive substances, with the ultimate aim of concentrations in the environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances.*”

In other words, we should be aiming to achieve concentrations in the environment close to zero by 2020 – not ‘close to zero discharges’; ‘close to zero concentrations in the environment’. The 2008 draft Strategy, on the other hand, expects radioactive discharges to continue provided they only add ‘close to zero’ to historic levels by 2020. Achievement of the OSPAR Objective is supposed to take into account, inter alia: legitimate uses of the sea (for example the legitimate right to harvest clean marine food); and technical feasibility (for example the fact that it is technical feasible to store spent fuel without reprocessing it).

Continuing to allow radioactive discharges into the marine environment, even if these were to stop in 2020, will not achieve ‘close to zero’ concentrations in the marine environment by 2020.

## 1.3 Effective Policy?

The 2008 draft Strategy describes UK policy to minimise discharges as “*increasingly effective*”. It says trends in discharges of man-made radionuclides over the last 20 years show large and sustained reductions in discharges of the most radiologically significant radionuclides, particularly from the nuclear fuel reprocessing sector.

An alternative view is that, whilst there have been welcome reductions in radioactive discharges from levels bordering on the criminally negligent, the recent chaos at Sellafield has left the 2002 Strategy – already found wanting by all the main UK environment groups<sup>6</sup> – in tatters, so now it needs to be replaced by an even less ambitious document.

The joint NGOs response to the draft 2000 Strategy complained that it treated:

*“...with contempt the views of the majority of OSPAR Contracting Parties, as expressed in OSPAR Decision 2000/1, that current discharge authorisations for reprocessing plants should be reviewed as a matter of priority with a view to implementing the non-reprocessing option (for example dry storage) for spent nuclear fuel. The omission of any consideration of the dry storage option is inexplicable and wholly wrong, since this is a technically feasible means of eliminating the massive discharges from nuclear reprocessing”.*

A policy that aspires to be “*increasingly effective*” should have at least looked at the alternatives to reprocessing. The 2008 draft Strategy appears to continue this failure to examine alternative options. Paragraph 3.2.2 discusses, for example, “most appropriate abatement technology” – end-of-pipe technology - but fails to examine the introduction of new cleaner processes.

**It is now long past the time when there should have been a serious examination of alternatives to reprocessing. The UK Government can no longer claim there is no alternative to reprocessing spent Magnox fuel and that THORP must complete its overseas contracts. If the UK is to meet its OSPAR obligations reprocessing must be stopped as quickly as technically feasible.**

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<sup>6</sup> See for example submission to the 2000 draft Strategy consultation, dated 22<sup>nd</sup> September 2000, from CORE, CND, FoE (EWNI), FoE (Scotland), Greenpeace and WANA.

## **2.0 Sellafield**

The controversial nuclear facility at Sellafield, owned by the Nuclear Decommissioning Authority (NDA) is home to two nuclear reprocessing plants, a plutonium (mixed-oxide or MOX) fuel fabrication plant, and various other radioactive waste facilities. The only nuclear electricity generating power station at the site, Calder Hall - the world's first commercial station, opened by the Queen in 1956 - closed in 2003.

Reprocessing is the chemical separation of plutonium and unused uranium from spent nuclear waste fuel. It is only one management option used for only around 5 – 10% of spent fuel generated worldwide.<sup>7</sup> It is a completely unnecessary process. The bulk of radioactive discharges going into the North-East Atlantic originate from Sellafield.

### **2.1 Magnox Reprocessing**

The older of the two reprocessing plants is the Magnox reprocessing plant, also known as B205. This reprocesses spent fuel from Britain's first generation Magnox reactors, also owned by the NDA. Only two of these reactors remain operational. Oldbury in Gloucestershire is currently planned to close in December 2008, and Wylfa on Anglesey in December 2010.

B205 remains Sellafield's most polluting plant in terms of discharges of radioactivity into the sea and atmosphere, although discharge levels were much higher in the 1960's and 1970's.

The OSPAR Sintra Agreement, signed by John Prescott in 1998, led to an announcement by BNFL (Sellafield's owners at the time) that B205 would close around the end of 2012.<sup>8</sup> It's clear the closure of B205 at the end of 2012 was important, according to the Government, for the UK to meet its OSPAR commitments, partly because there is at least a five year time lag before discharges of radioactivity into the Irish Sea would cease after closure.<sup>9</sup>

Based on BNFL's projected shut-down of all of the UK's Magnox power stations by 2010, and the quantity of fuel still to reprocess, this was always going to be a challenging target given the plant's age and recent performance. Achieving the 2012 target would have required a doubling of the throughput at B205 from around 500 tons/yr in 1998 to more than 1000 tons/yr. This would have meant an increase in discharges too. Increases in throughput were achieved in 2003-06, reaching a peak of more than 1000 tons/yr in 2005. But in 2007 throughput plummeted to only just over 200 tons.

So, with the exception of some notable abatement measures, rather than planning a '*progressive and substantial reduction*' in discharges from this most polluting of the UK nuclear facilities by ending reprocessing – the 2002 Discharges Strategy simply planned to discharge the same overall number of Becquerels, but over a shorter period of time.

### **2.2 Closure Delayed**

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<sup>7</sup> Sources, Effects and Risks of Ionizing Radiation, UNSCEAR, 2000. Annex C. Para 150, page 188.

<http://www.unscear.org/docs/reports/annexc.pdf>

<sup>8</sup> British Nuclear Fuels, Press Release, 23 May 2000. See Appendix 1 of BNFL Stakeholder Dialogue, Magnox Task Group Working Paper, November 2000. [http://www.the-environment-council.org.uk/component/option.com\\_docman/task.doc\\_download/gid,3/Itemid,64/](http://www.the-environment-council.org.uk/component/option.com_docman/task.doc_download/gid,3/Itemid,64/)

<sup>9</sup> BNFL National Stakeholder Dialogue, Discharges Working Group, Interim Report, 28<sup>th</sup> Feb 2008, See table 7 page 10.

[http://www.the-environment-council.org.uk/component/option.com\\_docman/task.doc\\_download/gid,8/Itemid,64/](http://www.the-environment-council.org.uk/component/option.com_docman/task.doc_download/gid,8/Itemid,64/)

The NDA confirmed in its Draft Business Plan that it was extending the life of B205 to at least 2016.<sup>10</sup> It should be noted that whilst the 2008 draft Strategy gives January 2016 as the revised closure date, the NDA Business Plan says “2016 or later”.

The NDA blames poor throughput at B205 on problems at the plant and logistical difficulties in receiving fuel from power stations being decommissioned.<sup>11</sup> However the NDA has already extended the life of the Wylfa Magnox nuclear station on Anglesey, from March 2010 to the end of that year, further delaying the completion of Magnox spent fuel reprocessing.<sup>12</sup> And the 2008 draft Discharge Strategy says the NDA is considering whether Wylfa *and* Oldbury could continue generation beyond their current closure dates. Given the NDA’s failure to meet the promised 2012 closure date for B205, it would be unacceptable to add yet more spent fuel to the stockpile awaiting reprocessing.

The 2008 draft Strategy claims the delay in the completion of Magnox reprocessing will not affect the ability of the Sellafield site to meet the target in the 2002 strategy of reducing alpha/beta discharges to around 50 TBq per year by 2020. Nor will it mean that more radioactivity is discharged overall. Given that possible life extensions are being considered for the last two remaining Magnox stations, and the uncertainty surrounding the new closure date for B205, these claims must be open to question.

What is more worrying is that the whole credibility of the UK Radioactive Discharges Strategy and the BNFL and NDA Stakeholder Dialogue processes has been severely undermined. For example, para 7.3.19 of the 2002 Strategy document stated that:-

*“It is a key objective for BNFL to achieve closure of B205 by about 2012 ... BNFL will closely monitor progress and will deploy contingency plans if it appears that B205 will fail to achieve the required level of throughput. In the event of a serious shortfall in performance, there would be no alternative but to review the closure programme, and bring forward the closure dates of some Magnox stations.”*

Reprocessing of Magnox spent fuel has, in the past, been regarded as essential, because it begins to corrode once it has been wetted. BNFL finally admitted in 2003<sup>13</sup> that dry storage would be technically feasible, should B205 break down, having previously claimed Magnox spent fuel MUST be reprocessed. Encapsulating the spent fuel in concrete has also been considered as an alternative fuel management option.

**Far from bringing forward closure dates of Magnox reactors when it became clear the 2012 objective was not going to be met, the NDA has actually done the opposite – extended the life of one reactor, and is considering extending the life of another.**

## 2.3 THORP

The newer of the two reprocessing plants is THORP – the Thermal Oxide Reprocessing Plant. THORP started operations in 1994 to reprocess spent fuel from Britain’s newer Advanced Gas-cooled Reactors (AGRs) now owned by British Energy, and overseas Light Water Reactors (LWRs).

The 2002 Strategy implied that THORP would continue operating until 2024. However, this was always unlikely, and the Strategy made clear that operation beyond 2016 would be dependent on new business, and that any new business would require approval by the Government who would look at any application in the light of the ‘Bergen Declaration’. This declaration required states to look at alternative spent fuel management

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<sup>10</sup> U. K. Nuclear Decommissioning Authority, *Draft Business Plan 2008/11*, p.16, <http://www.nda.gov.uk/documents/loader.cfm?url=/commonspot/security/getfile.cfm&pageid=15799>.

<sup>11</sup> See *The Legacy of Reprocessing in the United Kingdom* by Martin Forwood, International Panel on Fissile Materials, July 2008. [http://www.fissilematerials.org/ipfm/site\\_down/rr05.pdf](http://www.fissilematerials.org/ipfm/site_down/rr05.pdf)

<sup>12</sup> BBC 8th Nov 2007 [http://news.bbc.co.uk/1/hi/wales/north\\_west/7085001.stm](http://news.bbc.co.uk/1/hi/wales/north_west/7085001.stm)

<sup>13</sup> BNFL World March 2003, “A Life Beyond Closure”.

options, once current reprocessing contracts come to an end. No new business has been forthcoming since 2002.

Like B205, throughput at THORP has neither been reliable nor to specification – with just over 5000 tons completed during the first ten years of operation, rather than the 7000 tons expected. Given the total order book was for around only 9,600 tons it should have been able to meet a scheduled closure date of around 2010/11. But this was not to be.

THORP was temporarily closed on 21st April 2005 because of the spillage of 18,000 litres of highly radioactive liquid waste which began seeping from a broken pipe around July 2004. The pipe then suffered a major fracture around January 2005. Although no radiation escaped outside of the building, British Nuclear Group (BNG), the BNFL subsidiary operating Sellafield on behalf of the NDA, should have been able to discover the leak “within days”. Yet it continued undetected for around eight months.<sup>14</sup> A criminal case, brought by the Health & Safety Executive (HSE), was heard by the Crown Court in Carlisle in October 2006, and BNG was fined £500,000 after pleading guilty. This was on top of a £2m penalty imposed on BNG by the NDA.<sup>15</sup>

The HSE’s Nuclear Installations Inspectorate (NII) highlighted a lack of a “*questioning attitude*” or “*challenge culture*” at the company. It added: “*The company fell well below the standard required by the licence conditions and these breaches amounted to serious offences*,”<sup>16</sup> and “*there has been a failure to learn from previous incidents*.” In a scathing editorial, *The Whitehaven News* asked if we are doomed to repeat the mistakes of the past. It seems you can have the world's most sophisticated nuclear technology, safety and fail-safe systems - but you can't legislate for human error.<sup>17</sup>

Although BNG received consent to restart operations at THORP from the NII in January 2007, the plant is still not fully operational. Reprocessing had to be abandoned again between January and March 2008 following the mechanical failure of an elevator system that lifts spent fuel. A return to full operation will be delayed until 2010 due to a lack of capacity to evaporate down high-level liquid waste.

These accidents have delayed the expected closure dates for THORP by at least five years to 2015/6. In fact nuclear physicist, Nils Bøhmer, of the Norwegian environment group, Bellona, was told on a recent visit to Sellafield the facility could still be operational in 2020.<sup>18</sup>

The 2008 draft Strategy says it assumes THORP will cease reprocessing operations in 2015. However, it also says that future discharges are dependent upon decisions yet to be taken on the management of spent fuel that is not currently planned to be reprocessed – for example some of the UK AGR fuel in wet storage at Sellafield and the PWR fuel currently in dry storage at Sizewell B. The NDA has been undertaking a review of nuclear materials options to inform such decisions.

Unlike spent fuel from Magnox reactors, there has never been any dispute about the technical feasibility of dry storing spent fuel from Advanced Gas-cooled reactors (AGRs) and Light Water Reactors (LWRs). UNSCEAR states that only around 5 to 10% of world spent fuel arisings are submitted for reprocessing; the rest is stored pending decisions about final disposal.<sup>19</sup>

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<sup>14</sup> See Energy Review Update No. 4 <http://www.no2nuclearpower.org.uk/reports/ERNewsletterNo4.pdf>

<sup>15</sup> Telegraph 17 Oct 2006 <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/10/17/npipe17.xml>

<sup>16</sup> BBC 24th Feb 2007 <http://news.bbc.co.uk/1/hi/england/cumbria/6392283.stm>

<sup>17</sup> Whitehaven News 1st March 2007 <http://www.whitehaven-news.co.uk/home/1.187467>

<sup>18</sup> Bellona 22nd August 2008 [http://www.bellona.org/articles/articles\\_2008/thorp\\_extended](http://www.bellona.org/articles/articles_2008/thorp_extended)

<sup>19</sup> Sources, Effects and Risks of Ionizing Radiation, UNSCEAR, 2000. Annex C. Para 150, page 188. <http://www.unscear.org/docs/reports/annexc.pdf>

Given that one of the principles underpinning the 2008 draft Strategy is the preferred use of ‘concentrate and contain’ in the management of radioactive waste over ‘dilute and disperse’, the Government should rule out any further reprocessing at THORP.

THORP is operating at a very low capacity whilst it waits for the installation of a new evaporator, probably in 2010. The plant is projected by Sellafield Ltd to reprocess just 300 tonnes of spent fuel this financial year (2008/09) and a further 300 tonnes in 2009/10, a majority of which will be British Energy AGR fuel.<sup>20</sup> An estimated 750 tonnes of foreign fuel still awaits reprocessing so some overseas customers are now unlikely to see their contracts completed until at least 2014/15 – some 10 years late. The Government says these overseas contracts must be honoured because “*to do otherwise would break existing contractual commitments and Government Undertakings. It could also invoke compensation payments which would outweigh the costs involved in meeting those commitments*”.<sup>21</sup>

But none of that applies to British Energy spent fuel. **In keeping with the implementation of the ‘concentrate and contain’ principle, the Government should instruct the NDA to reduce to the bare minimum the quantity of British spent fuel reprocessed.**

## 2.4 Virtual Reprocessing

The Government has agreed that nuclear waste can be returned to Sellafield reprocessing customers before their fuel has actually been processed in THORP. It says ‘advanced allocation’ “...offers a sensible approach to managing overseas spent fuel awaiting reprocessing”.<sup>22</sup> As overseas customers will be able to receive the products from having their spent fuel reprocessed, without the reprocessing actually taking place, **there is absolutely no reason why reprocessing overseas customers’ spent fuel should be allowed to override UK Government commitments, under international treaty to end radioactive discharges into the North-east Atlantic.**

## 3.0 Guidance to the Environment Agencies

DEFRA’s consultation on the draft Statutory Guidance to the Environment Agency<sup>23</sup> says up until now the Environment Agency’s regulatory regime for radioactive discharges has been based on Best Practicable Means (BPM) and Best Practicable Environmental Option (BPEO). The main focus of the draft Guidance is the change from BPM and BPEO to Best Available Techniques (BAT). This, it claims, will deliver a regime that is more consistent with environmental protection regimes in other countries and other regimes in England and Wales.

DEFRA held a consultation on a proposed Statutory Guidance to the Environment Agency on the regulation of radioactive discharges in 2002, but this was never finalised. Unlike this earlier document, the new draft is described as ‘a strategic high level document’ outlining key responsibilities, but not going into detail. This is to allow the Environment Agency regulatory independence. The development of detailed guidance – the Environment Agency’s *Regulatory Environmental Principles* (REPs) - has been left to the Environment Agency itself. DEFRA says it considers the REPs a suitable underpinning to the draft Statutory Guidance. The

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<sup>20</sup> CORE Briefing 23<sup>rd</sup> April 2008.

<http://www.corecumbria.co.uk/newsapp/briefings/briefsmain.asp?StrNewsID=248>

<sup>21</sup> Managing the Nuclear Legacy: a strategy for action, DTI, July 2002.

<sup>22</sup> Proposal on how to manage overseas spent nuclear fuel awaiting processing at Sellafield: Government response to the consultation, BERR November 2007. <http://www.berr.gov.uk/files/file42361.pdf>

<sup>23</sup> Consultation on the Statutory Guidance to the Environment Agency concerning the regulation of radioactive discharges into the environment, DEFRA, June 2008

<http://www.defra.gov.uk/corporate/consult/rad-discharges-eaguidance/consultation-doc-statutory-guide.pdf>



Environment Agency is currently carrying out a consultation on Radioactive Substances Regulation Environmental Principles (REPs) and Assessment of Best Available Techniques.<sup>24</sup>

**A clear, open, transparent, easily understandable explanation as to why England and Wales has decided to switch to BAT, and yet Scotland will continue to use BPM and BPEO is noticeable by its absence from the document.**

The definition of BAT, quoted in the EA Guidance consultation from OSPAR includes the following:

*The term "best available techniques" means the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste.*

The Environment Agency's consultation on Assessment of BAT says:-

*"The use of BAT also applies when determining the **most appropriate method of managing** particular types of radioactive waste".*<sup>25</sup> [emphasis added]

The Environment Agency's consultation on its REPs makes clear this applies to radioactive substances as well, so will apply to the management of spent fuel, which the UK Government does not define as 'waste'.

This document also explains that the reason for the change from BPM and BPEO to BAT is because the 1998 Sintra Agreement uses the term "Best Available Techniques". It is, therefore worth noting that the Agreement actually refers to guiding principles, one of which is:-

*"...best available techniques and best environmental practice, including, **where appropriate, clean technology**".* [emphasis added]

The Discharge Strategy Consultation includes the following principle:

*"...the use of Best Available Techniques (BAT) in England and Wales to prevent and, where that is not practicable, minimise waste generation and discharges to the environment."*

**It is clear the BAT principle should be applied to the management of spent fuel. When this is done it is difficult to conclude that reprocessing should be permitted to continue.**

#### **4.0 New reactors**

It is particularly disappointing that the 2008 draft Strategy has failed to quantify the potential discharges from new reactors, because, it says, these cannot yet be accurately quantified and are not included in the current discharge profiles.

Of course, if potential operators are going to attempt to show that new reactors are justified, discharges will have to be accurately quantified.

The Discharge Strategy consultation says:

*"It would be prudent to assume that a programme of new nuclear build is likely to replace or exceed current generating capacity during the time-frame covered by the strategy. On the basis of the low levels of discharges from current Pressurised Water Reactors (PWRs) in the UK and abroad, such a programme, on a purely*

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<sup>24</sup> <http://www.environment-agency.gov.uk/yourenv/consultations/2066484/?version=1&lang=e>

<sup>25</sup> Assessment of Best Available Techniques, Consultation Draft, Environment Agency, June 2008  
[http://www.environment-agency.gov.uk/commondata/acrobat/batconsultation\\_2068887.pdf](http://www.environment-agency.gov.uk/commondata/acrobat/batconsultation_2068887.pdf)

*illustrative basis, would not prevent the UK from achieving the objective of the OSPAR Radioactive Substances Strategy”.*

The Strategy also calls for flexibility in relation to reducing radioactive discharges in order “*to safeguard other Government objectives*”, such as the need to secure UK energy supplies by building new reactors or extending the life of existing reactors. (See para 3.2.1)

Clearly there will be cases where Government has competing objectives and it will therefore be forced to prioritise. However, this is not one of them. If nuclear power were the only way of providing a secure energy supply, this might be the case, but it is not. In fact the situation is worse than this. Tackling climate change must surely be one of the primary objectives of energy policy which means scarce resources need to be wisely invested to get the most solution per pound spent. If we are not doing that we are actually making things worse. Buying more reactors will cost around two to ten times more per pound than other carbon abatement measures and will happen around twenty to forty times more slowly. The alternatives are energy efficiency, renewables and combined heat and power generation.<sup>26</sup>

**So, the discharges strategy is allowing radioactive discharges from the nuclear generation sector to continue, when we could be phasing them out, in order to provide a technology which is actually going to make climate change worse than it would be if we implemented an alternative strategy.**

#### **4.1 Radiation and Health**

In 2007, researchers at the Medical University of South Carolina in Charleston who carried out a meta-analysis of 17 research papers covering 136 nuclear sites in the UK, Canada, France, the US, Germany, Japan and Spain, found an increase of 14-21% in the incidence of childhood leukaemia in children under 9 living close to the sites. In Germany the KiKK study on Childhood Cancer in the Vicinity of Nuclear Power Plants found higher incidences of cancers and a stronger association with nuclear installations than all previous reports.<sup>27</sup>

A report in 2004 by the Government’s Committee Examining Radiation Risks of Internal Emitters concluded that uncertainties about the risks of radiation might mean that we are exposed to a risk ten times higher than previously thought, so policy makers should adopt the precautionary principle.<sup>28</sup> In 2007 the Health Protection Agency’s (HPA) Independent Advisory Group on Ionising Radiation published a report on tritium<sup>29</sup> concluded that its hazard risk should be doubled. Tritium is most commonly found incorporated into water molecules, a factor not fully taken into account in the report, so this could make it even more hazardous.

The target for liquid tritium discharges in 2020, from the nuclear generation sector, remains at 850 TBq/yr as it was in the 2002 Strategy. However, this assumes no further lifetime extensions and no new reactors. As a result of the HPA report, this figure should be halved, at the very least. And it should not be a moveable feast depending on whether new reactors are built or lifetimes are extended. A target should be declared and stuck to. A target of 425 TBq/yr would seem prudent.

#### **4.2 Concentrations in the environment and doses**

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<sup>26</sup> Democracy Now, 16<sup>th</sup> July 2008, Amory Lovins: Expanding Nuclear Power Makes Climate Change Worse.  
[http://www.democracynow.org/2008/7/16/amory\\_lovins\\_expanding\\_nuclear\\_power\\_makes](http://www.democracynow.org/2008/7/16/amory_lovins_expanding_nuclear_power_makes)

<sup>27</sup> Reasonable Doubt, by Dr Ian Fairlie, New Scientist, 26<sup>th</sup> April 2008  
<http://www.newscientist.com/channel/opinion/mg19826535.300-comment-lets-take-cancer-clusters-seriously-this-time.html>

<sup>28</sup> <http://www.cerrie.org/report/>

<sup>29</sup> Review of Risks from Tritium, HPA, Advisory Group on Ionising Radiation, November 2007.  
[http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1197382221858](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1197382221858)



Highlighting the need to work towards ‘close to zero concentrations’ of radioactivity in the environment, is the fact that, despite the overall 100-fold reduction in releases, radiation dose rates to local community residents (seafood eaters) have, in some cases, increased by 75% since 2000 – a reflection of greater seafood consumption rather than an increase in concentrations of radioactivity in seafood. This is a warning that reduced discharges do not necessarily result in lower doses to humans.<sup>30</sup>

It should also be noted that, while overall discharges have decreased in recent years due to the lack of reprocessing throughput caused by technical problems, some individual elements are still showing increased concentrations in the environment. A case in point is the concentration of Americium-241 in sediments – an alpha and gamma emitter with a half-life of 458 years. Its increase is because it is a decay product of Plutonium-241 (13 year half life) which has already been discharged. There could also be a remobilisation of sediments occurring.<sup>31</sup>

Para 5.3.4 notes that in 2006, the radionuclides giving the largest contribution to the food component of the dose (71%) were plutonium-239/240 (Pu-239/240) and americium-241 (Am-241).

**Increasing concentrations of Americium-241 and the remobilization of plutonium in sediments highlights the need to end discharges into the environment as soon as possible.**

### **5.0 Decommissioning and clean-up**

With regard to the decommissioning and clean-up of nuclear facilities and remediation of contaminated land, the Draft Discharges Strategy calls for flexibility because of the need for:

*“...balancing the benefits of hazard reduction and environmental restoration against the discharges generated from the processing of radioactive materials and wastes.”*

As former Environment Agency Inspector Ian Jackson says, we should view the problem in a different way. By setting tough standards we can drive innovation, reduce waste generation and ultimately reduce overall life-cycle costs.<sup>32</sup> A sustainable decommissioning policy must be based on a clear set of environmental principles, in particular: the polluter pays principle, the concentration and containment principle and the proximity principle. Decommissioning must not be used as an excuse to increase discharges.

### **6.0 Evaluation of Progress**

The discharges consultation document claims that most of the aims of the 2002 UK strategy for radioactive discharges are broadly being met or are likely to be met by 2020. However, it does admit that the target of ending Magnox spent fuel reprocessing at Sellafield by around 2012 is unlikely to be met.

As the plant responsible for the majority of the radioactive discharges into the North East Atlantic, this must surely be the most important target to meet. It is claimed that this will “not affect overall discharges or compromise the expected reductions in discharges from the site by 2020”. This can only be true if we accept a very peculiar interpretation of the objective of achieving ‘close to zero concentrations in the environment by 2020’. In any case, closure is now not expected until 2016, and there is a time lag, after closure, of five years before some of the discharges for the plant will cease.

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<sup>30</sup> U. K. Environment Agency, Environment & Heritage Service, Food Standards Agency, and Scottish Environment Protection Agency, *Radioactivity in Food and the Environment*, RIFE-12, Summary, p. 11, <http://www.cefas.co.uk/publications/rife/rife12.pdf>

<sup>31</sup> Ref 30, Figure 2.16

<sup>32</sup> Nuclear Engineering International, February 2004, ‘Decommission Improbable’ by Ian Jackson. [http://www.jacksonconsult.com/content\\_pdf/Decom\\_Improb\\_Article.pdf](http://www.jacksonconsult.com/content_pdf/Decom_Improb_Article.pdf)

The consultation states that “[t]he NDA is currently exploring contingency plans for alternative management options for Magnox spent fuel”. Delays whilst further studies are carried out appears to be the order of the day. First there were assurances that “*contingency plans [would be implemented] if it appears that B205 will fail to achieve the required level of throughput*” including early closure of Magnox stations. Now that it is too late for early closure to make a significant difference it is claimed that contingency plans need to be explored, despite BNFL’s admission in 2003 that there were alternatives to Magnox reprocessing. It is time to implement those alternatives.

It is claimed that: “*[t]rends in radioactive discharges in general are currently in line with, or are reducing faster than, the projections given in the 2002 strategy. As a result, measured concentrations in the marine environment have also declined, most noticeably at those locations closest to Sellafield*”.

Yet, discharges will have fallen in recent years simply because the two reprocessing plants at Sellafield have not been operating due to technical problems. Sellafield plc has been working to resolve these problems, so discharges can be expected to rise again over the next few years.

## **7.0 Future Reprocessing**

The discharges consultation documents states that the UK Government has concluded that any new nuclear power stations should proceed on the basis that spent fuel will not be reprocessed and the plans for, and financing of, waste management should proceed on this basis. The White Paper also stated that the Government is not currently expecting proposals to reprocess spent fuel from new nuclear power stations.<sup>33</sup>

However, the possibility of such proposals being brought forward in the future is left open. The Government says they would need to be considered on their merits at the time. Government officials have also said that reprocessing spent fuel from new reactors has not been ruled out.<sup>34</sup> Sellafield trade unions have already started campaigning for a new reprocessing plant so that spent nuclear fuel from new reactors can be reprocessed, and new reprocessing contracts from abroad can be sought.<sup>35</sup>

In addition, Prime Minister Gordon Brown was recently reported to have discussed with the Japanese Prime Minister the possibility of new Japanese reprocessing contracts for Sellafield to ‘revive the UK’s declining reprocessing industry’.<sup>36</sup>

**The Government must specifically rule out future reprocessing as running counter to its obligations under the OSPAR Treaty.**

## **Recommendations**

1. It is regrettable that the 2008 Strategy is around four years late. Given the importance of the planned 2012 closure of the Magnox Reprocessing Plant to the 2002 Strategy, those four years would have provided a crucial opportunity for consultees to re-affirm the vital need to find alternative magnox spent fuel management options, and speed up the closure of magnox reactors. **Future Strategy Updates must be produced on schedule**

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<sup>33</sup> “Meeting the Energy Challenge: A White Paper on Nuclear Power” BERR, Jan 2008 (See page 114)

See also: RobEdwards.com 23rd May 2007 [http://www.robedwards.com/2007/05/uk\\_signals\\_aban.html](http://www.robedwards.com/2007/05/uk_signals_aban.html)

Independent on Sunday 13th Jan 2008

<http://www.independent.co.uk/environment/green-living/sellafield-cleanup-will-cost-16334bn-769990.html>

<sup>34</sup> Nuclear Fuel, 18th June 2007

<sup>35</sup> GMB 18th Jan 2008 <http://www.gmb.org.uk/Templates/Internal.asp?NodeID=96494>

<sup>36</sup> Telegraph 23rd June 2008 <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/06/23/cnjap123.xml>

**2. The 2008 Strategy fails to deliver the UK Government's commitments under the OSPAR Treaty.** The Government should be aiming to achieve concentrations in the environment close to zero by 2020 – not 'close to zero discharges'.

3. A policy that aspires to be "*increasingly effective*" should examine the alternatives to reprocessing. **It is now long past the time when there should have been a serious examination of alternatives to reprocessing. The UK Government can no longer claim there is no alternative to reprocessing spent Magnox fuel and that THORP must complete its overseas contracts. If the UK is to meet its OSPAR obligations reprocessing must be stopped as quickly as technically feasible.**

4. Closing the Magnox Reprocessing Plant by 2012 was a key objective of the 2002 Strategy. IF the phase-out of magnox reprocessing fell behind schedule, the closure of Magnox reactors was to be brought forward. **Far from bringing forward closure dates of Magnox reactors when it became clear the 2012 objective was not going to be met, the NDA has actually done the opposite – extended the life of one reactor, and is considering extending the life of another. The remaining Magnox reactors must be closed on schedule or earlier.**

5. BNFL is now saying that the THORP reprocessing plant could still be open in 2020 – partly as a result of its various technical problems. To avoid this outcome, in keeping with the implementation of the 'concentrate and contain' principle, **the Government must instruct the NDA to reduce to the bare minimum the quantity of British spent fuel reprocessed.**

6. The Government has accepted that THORP's overseas customers will be able to receive the products from having their spent fuel reprocessed, without the reprocessing actually taking place, therefore **there is absolutely no reason why reprocessing overseas customers' spent fuel should be allowed to override UK Government commitments, under international treaty to end radioactive discharges into the North-east Atlantic.**

7. **A clear, open, transparent, easily understandable explanation as to why England and Wales has decided to switch to BAT, and yet Scotland will continue to use BPM and BPEO needs to be included in the Statutory Guidance to the Environment Agency document.**

**8. It is clear that the application of BAT principle to the management of spent fuel would rule out reprocessing. It should, therefore, not be permitted to continue.**

**9. The discharges strategy should not allow radioactive discharges from the nuclear generation sector to continue.** This will allow new reactor construction which is will make climate change worse compared to the implementation of an alternative strategy.

**10. Targets for liquid tritium discharges should be halved so the strategy is commensurate with recent HPA research.**

**11. Increasing concentrations of Americium-241 and the remobilization of plutonium in sediments highlights the need to end discharges into the environment as soon as possible.**

**12. Decommissioning must not be used as an excuse to increase discharges.**

**13. The implementation of non-reprocessing alternatives for spent fuel management are well overdue.**

**14. The Government must specifically rule out future reprocessing as running counter to its obligations under the OSPAR Treaty.**