



February 2005

NDA Draft Annual Plan for Consultation
Greenpeace Comments

1.0 Summary

Greenpeace welcomes the opportunity to comment on the NDA's Draft Annual Plan. It also welcomes the commitment of the NDA's Board Chairman, Sir Anthony Cleaver, to openness and transparency. Greenpeace also suggests ways of identifying in which of the Nuclear Decommissioning Authority's (NDA's) documents key issues raised by Stakeholders should be dealt with.

First and foremost, Greenpeace recommends that the NDA begins an open and transparent examination of the case for the continued operation of waste producing facilities: the Sellafield Mox Plant (SMP); the Thermal Oxide Reprocessing Plant (THORP); and the Magnox reactors and reprocessing plant, as soon as it begins work on 1st April 2005. The Draft Annual Plan must be amended so as not to pre-empt the outcome of this examination by continuing a 'business as usual' approach to the facilities that the NDA will take ownership of. Failure to do so will reflect badly on the *credibility of the [NDA] as an open and transparent organization.*

Magnox: A Ministerial decision on the justification for the continued operation of Magnox stations is still pending. A leading nuclear economist has said that there can be little public confidence in the idea that Magnox avoidable costs are definitively below the selling price of electricity, and that this proposition should be independently tested. It would hardly be an auspicious beginning for the NDA if it based its case for the continued operation of Magnox reactors on information which BNFL has refused to have independently examined (as per the request from the Environment Agency). The environmental advantages to be gained from ending Magnox reprocessing as early as possible – which would give an 80% reduction in marine discharges from Sellafield - argue strongly in favour of closing the remaining Magnox reactors or at least employing alternatives to reprocessing Magnox spent fuel.

SMP: The Draft Annual Plan simply announces as a fait accompli that Sellafield will produce MOX in line with agreed contracts. **It must be changed. The operation of SMP must be made dependent on the outcome of an open and transparent re-examination of the economic and environmental case. The Draft Annual Plan should also detail arrangements for developing alternatives to operating SMP, and treating plutonium as a waste.**

THORP: This plant will run out of business by around 2010. It is clear THORP could complete its work for overseas customers before 2007. A technical and economic case for continuing with reprocessing at THORP beyond the end of 2006 has not been made. **The Draft Annual Plan should be amended to reflect the need for an open and transparent examination of the technical and economic case for continuing to reprocess UK spent nuclear**

waste fuel.

The Draft Annual Plan, in its current form, severely damages the credibility of the NDA. The operation of THORP, SMP and the Magnox cycle needs to be made much more tentative in the Annual Plan and details should be set out about just how exactly the NDA intends to carry out an open and transparent examination of the technical and economic justification for the continued operation of these facilities.

The NDA has a duty to have particular regard to the need to safeguard the environment, yet there is almost no mention in the Draft Annual Plan about how it intends to implement this policy. With regard to this, Greenpeace notes that the activities described under the Draft Plan do not conform with the best environmental principles for nuclear waste management. Greenpeace has attached a copy of these principles as an annexe to this submission.

Finally, the NDA must make note of the European Competition Commission's investigation into the state aid aspects of the NDA's relationship with New BNFL and its subsidiaries. Depending on the outcome of that investigation the planned operation of a number of facilities may be radically altered, subject to what is or is not allowed as state aid from the NDA to support current operations.

The Plan should be amended and expanded on to provide a full explanation of where NDA money will be used to either subsidise or support operations currently considered 'profitable.' It is only through full exposure of the accounts and state aid support for operations of plants under the NDA's ownership that the public and Parliament can make meaningful decisions on the cost-benefit of allowing certain operations to take place.

Comments on the NDA Draft Plan

2.0 Introduction

Greenpeace welcomes the NDA's commitment to openness and transparency as set out in the Chairman's Preface to the Annual Plan. In particular we welcome Sir Anthony Cleaver's

"...personal commitment to openness and transparency and to the continued development of a proper and effective stakeholder engagement framework".

As part of this process, the suite of documents which the NDA will be publishing will include:-

- An Annual Plan;
- A Five-yearly Strategy Statement;
- An Annual Report.

In addition each site will publish a:-

- Near Term Work Plan
- Life Cycle Baseline Plan.

As this is the first year that any of these documents will have been published there is a potential for confusion about the intended purpose and content of each document. It would, therefore, be sensible to include a further explanation in the Annual Plan of the role of all forthcoming documents.

One additional piece of information which would also assist stakeholders to understand where and when we can expect different issues to be discussed might be, for example, a table of the key issues identified in paragraph 6 the Draft Framework for Stakeholder Engagement and Transparency for the NDA, with an explanation, beside each issue, of which of the above documents the NDA expects to discuss that issue.

3.0 Lack of justification for continued production of nuclear waste.

It is worth remembering, as Sir Anthony Cleaver says in his Preface, “...*why the NDA is being established*”. On 28th November 2001, the Secretary of State for Trade and Industry, Patricia Hewitt, told the House of Commons that:-

“As a result of the increase in provisions for liabilities, the current estimated value of [BNFL’s] total liabilities now exceeds the value of its total assets by some £1.7 billion”.

In other words, the Company was bankrupt. In her statement, Patricia Hewitt said that the “...*Government’s priority is to ensure that the legacy is managed safely, securely and cost-effectively in a way that ensures the protection of the environment*”.

As will be clear by now, the main criticism by environment groups of the Government’s plans to establish the Authority is that the NDA will own and continue to operate, through its contractors, nuclear waste producing facilities, which will mean further unnecessary radioactive contamination of the environment. These facilities include:-

- BNFL’s ageing Magnox reactors until the last one, Wylfa, closes in 2010.
- The Magnox reprocessing plant at Sellafield until it closes around 2012.
- The Thermal Oxide Reprocessing Plant at Sellafield which reprocesses spent fuel from British Energy’s Advanced Gas Cooled Reactors and foreign light water reactors.
- The Sellafield MOX Plant which is intended to manufacture plutonium fuel from weapons-useable plutonium extracted from spent nuclear waste fuel during the reprocessing process.

The NDA’s plan simply looks like ‘business as usual’ at all the BNFL sites. Clearly, if dealing with the nuclear waste we have already produced really *is* the main priority, a re-examination environmental impacts and of the financial prudence of expenditure on activities which continue to produce nuclear waste would be the sensible starting point.

Yet, there is no mention in the Annual Plan of how the NDA plans to fulfill the commitment made in the White Paper to report annually on the “*rationale for keeping [THORP, SMP and the Magnox reactors] open*”. [para 5.24 & 5.27]. The Energy Act (2004) does not translate this commitment into a very clear clause. However, the Explanatory Notes on the Act say:-

“[Section 14] Subsection (5) requires that the report must also deal separately with activities in respect of decommissioning and clean up and operational installations and facilities such as the Magnox stations, THORP and SMP. This reflects the commitment in the White Paper to provide specific information on the performance of Magnox, THORP and SMP and the rationale for keeping them open”.

The White Paper recognizes the importance of these issues to “*the credibility of the [NDA] as an open and transparent organization*”. It will indeed be unfortunate if the process of justifying the continued operation of these facilities is restricted to the Annual Reports. Schedules 2 and 3 of the Act set out how the preparation and revision of Annual Plans, and the NDA’s five-yearly Strategy must be done in “*consultation with stakeholders*”. However, there is no such provision for the Annual Report which is merely an explanation of what has happened during the previous year.

The Annual Plan does say:-

“The NDA is required, by the Government policy as set out in the July 2002 White Paper ‘Managing the Nuclear Legacy’ paragraph 5.24, to set out in our Annual Report and Accounts ‘specific information, consistent with the requirements of commercial confidentiality, on the financial and operational performance of THORP and SMP and the rationale for keeping the plants open’. The tables above present only a single year’s figures on a cash basis rather than on accounting or economic viability bases and therefore do not provide a suitable basis for assessing commercial viability”.

In a recent letter from the Comptroller and Auditor General, to Michael Meacher MP, Sir John Bourn says:-

*“From April 2005, the Secretary of State will be responsible for decisions on the future of the SMP on the basis of advice from the NDA. It is likely that the Government will wish to consider the case for continued operation of this plant as a result of the change in responsibilities”.*¹

As noted in the summary, it is not only on the SMP that the NDA should justify the commissioning, or continued operation, of nuclear facilities it will control. The Plan should explain where the NDA plans to provide state aid for support – either through waste management or commissioning costs. If this information is not made available then claims that operations are profitable will stand, even though they may in fact be leading to a drain on the taxpayer.

Greenpeace, therefore, recommends that the NDA begins an open and transparent examination of the financial and environmental case for the operation of SMP, as well as the continued operation of THORP, and the Magnox cycle, as soon as it is established on on 1st April 2005. Simply reporting the rationale for keeping these plants open in the Annual Report is not acceptable.

¹ Letter from Sir John Bourn KCB, Comptroller and Auditor General, to Michael Meacher MP, dated 8th September 2004.

It should also be noted that the "Draft Framework For Stakeholder Engagement and Transparency for the Nuclear Decommissioning Authority (NDA)"² identifies the case for continued operation of THORP, SMP and the Magnox Stations as a key issue which stakeholders would like to seek active engagement on.³

It may well be that arrangements are already in place for the required open and transparent examination of the case for the continued operation of waste producing facilities as part of arrangements to allow:-

"... stakeholders to input advice and comment on the NDA strategy ... before [it is] submitted to the Secretary of State for approval".⁴

Unfortunately, however, the current Annual Plan reads as though these issues have already been decided.

The Draft Annual Plan must be amended to reflect a desire not to pre-empt the outcome of the examination of the case for the continued operation of waste producing facilities. Failure to do so will, in the words of the White Paper, reflect badly on the credibility of the [NDA] as an open and transparent organization.

4.0 Magnox Reactors and Reprocessing

Section 2 of the Annual Plan begins by stating that *"four of the eleven Magnox stations built are currently operational, and by 2010 all of the stations will be closed"*. It says that the stations **WILL** continue to generate electricity until their planned shutdown dates between 2006 and 2010.

If the NDA was really planning to involve stakeholders in an open and transparent re-examination of the case for the continued operation of these reactors the wording would be much more tentative.

There are several reasons why the economics of continuing to operate Magnox reactors should be re-examined, in addition to the fact that the Government has committed the NDA to re-examine the case for the continued operation of the Magnox reactors in the White Paper, as well as the obviously prudent nature of taking such a step, as pointed out by Sir John Bourn, now that an NDPB has taken over responsibility for these reactors from a public corporation.

Firstly the Environment Agency issued new discharge Authorisations for the Magnox reactors to be effective from 18th December 2002, despite the fact that Ministers were *"... continuing to consider the matter of justification"*. A Ministerial decision on the justification of the Magnox sites is still pending in January 2005. Obviously such a justification exercise, which should

² <http://www.dti.gov.uk/nuclearcleanup/nws/nws-np.htm#designations>

³ Para 6.

⁴ NDA Arrangements for Stakeholder Engagement (Draft)

have been carried out by the Secretary of State for Environment, Food and Rural Affairs, would have to include an economic examination of the case for continuing to operate the remaining four stations.

Secondly, BNFL has freely admitted that the Magnox stations are loss-making, but says it would lose more money if they were closed immediately. Former CEO, Norman Askew, told the Trade and Industry Select Committee in July 2002 that:-

*“You will lose money if you close them down ... and you lose money if you run them to the end of their lives but a lot less money...”*⁵

BNFL claims that the income from continuing to operate these plants exceeds the “avoidable costs”, but ignores unavoidable costs, which would continue to be incurred even if Magnox generation were to cease. However, nuclear economist, Gordon MacKerron concludes that:-

“...there can be little public confidence in the idea that Magnox avoidable costs are definitively below the selling price of electricity. Testing this proposition again in a transparent and accountable way would seem to be a necessary condition for any future justification and approval of Magnox operation, and this would in turn require the appointment of genuinely independent experts to carry out the necessary work”.⁶

Several respondents to the Environment Agency’s consultation, before the new discharge authorizations were issued, expressed the view that BNFL had underestimated the avoidable costs of continuing to operate the Magnox stations. In its Proposed Decision of August 2001, the Agency noted

“...correspondence between Greenpeace and the Finance Director of BNFL and Finance Manager of Magnox Electric concerning the company accounts of BNFL and Magnox Electric 1999 – 2000”. [PDD P6B.171]

The Agency asked BNFL to “*seek an opinion from independent financial specialists on the matters raised by respondents*”.

*“BNFL declined to do this but instead offered a meeting between the company’s own senior financial executives and the Agency’s Director of Finance and Chief Economist. However the Agency does not consider such a meeting to be an acceptable alternative to an opinion on the matter from independent financial specialists ... **the Agency does not regard this matter as fully resolved to its satisfaction**”* [emphasis added]. [PDD Summary, Page 11].

It would hardly be an auspicious beginning for an organization committed to open and transparent working if it based its case for the continued operation of Magnox reactors on information which BNFL has refused to seek an independent examination of, despite a request from the Environment Agency.

⁵ House of Commons Trade and Industry Committee, Managing the Nuclear Legacy: Comments on the Government White Paper, Fifth Report of Session 2001-02, Volume II: Minutes of Evidence and Appendices para 273,

⁶ Letter from Gordon MacKerron to David Chaytor MP dated 18th October 2003.

Thirdly, the late Mike Sadnicki complained that it is almost impossible to decipher what is really going on from BNFL Accounts. An urgent review of Magnox costs is essential to avoid the possibility that the taxpayer may in fact be subsidizing the unjustifiable (and therefore unlawful) continued operation of these reactors.⁷

Finally, the environmental advantages to be gained from ending Magnox reprocessing as early as possible argue strongly in favour of keeping the quantity of spent Magnox fuel requiring reprocessing to the absolute minimum, by closing the remaining reactors as soon as possible.

BNFL has said that it intends to close the Magnox reprocessing plant (B205) around 2012, and this is a major 'Strategy Target' of the UK Radioactive Discharges Strategy. Meeting this deadline is crucial to the aim of achieving 'close to zero' concentrations of artificial radionuclides in the environment by 2020. Some 80% of the estimated critical group dose from Sellafield's current liquid discharges is attributable to Magnox reprocessing. In addition, there is a time lag of up to 5 years before we will see reductions in discharges of some radionuclides after B205 has closed.

The closure of B205 is inextricably linked to the closure of the Magnox reactors, because BNFL insists that spent Magnox fuel must be reprocessed. The quantity of spent Magnox fuel already in storage and yet to be produced means that the strategy of closing B205 by 2012 relies on being able to increase the throughput of the plant. This means that the NDA will begin life with radioactive discharges from Sellafield (apart from Technetium-99) going up.

For many years BNFL has insisted that spent Magnox fuel must be reprocessed for technical reasons yet has recently signalled there are alternatives to Magnox reprocessing.

In relation to the issue of whether magnox spent fuel can be stored and/or conditioned – as opposed to being reprocessed - Barry Snelson, Director of Sellafield Operations, told BNFL World (March 2003) that:-

"We have started to look at insurance policies should the FHP or B205 fail for some reason. The options we have in hand are technically feasible and we know that if the worst happens there are possible alternatives such as direct disposal in grout, dry storage or even reprocessing through THORP. These options are not cheap and we would have to take into account the views of the regulators and other key stakeholders in assessing them"

In the BNFL National Stakeholder Dialogue document: BNFL Update to Recommendations and Responses to Working Groups – Main Group March 2004, the issue of Magnox reprocessing is also discussed.⁸

⁷ Examination of BNFL Reports and Accounts, Mike Sadnicki, 12 March 2002, Published by Nuala Ahern MEP, member of the Green Group of the European Parliament.

⁸ <http://www.the-environment-council.org.uk/docs/BNFL%20Update%20to%20the%20Recommendations%20and%20Responses%20from%20Work.pdf>

The Magnox reprocessing target for the financial year 2003/4 of 905 tonnes had already been exceeded by 25th February, by 71 tonnes. The amount of Magnox fuel to be reprocessed before the end of the reprocessing programme is some 8,700 tonnes assuming that the stations continue to operate to their declared lifetimes. Clearly this is a tight schedule.

Apart from making use of THORP for Magnox reprocessing, which appears to present several problems:-

“For Magnox fuel, which is already wet, other contingency plans have included packaging the intact fuel elements in drums for interim surface storage. Research has concentrated on the thermal and corrosion effects of a range of encapsulants. Full-scale durability trials of the resultant encapsulated package have been encouraging. However, there are associated regulatory and other stakeholder issues associated with this option, particularly around long-term storage of Magnox fuel. BNFL is also examining contingency plans for Magnox fuel which has not been wetted.”

It is beholden on the NDA to explain whether it has had discussions with BNFL on the alternatives to Magnox reprocessing - on both financial and environmental grounds. The results of these discussions should form part of the NDA’s papers on justification for the continued operation of B205.

Magnox decommissioning

In section 2.2, the information on the progress of decommissioning at the various Magnox stations is provided in a way which makes comparison between stations difficult. For example, it would have been sensible to explain why some stations are taking part in an Environmental Impact Assessment for Decommissioning process, whereas for others, including some closed many years ago, an EIAD is not mentioned.

For Bradwell, Calder Hall and Chapelcross, we are told that de-fuelling has started and will take three years – but we are not told when it started, so it is not possible to see when it will finish. Worryingly, de-fuelling appears to be a process which takes three years. But we are not told how B205 can meet its objective of closing in 2012 if Wylfa does not close until 2010.

Magnox Station	De-fuelling Progress	Progress on Environmental Impact Assessment for Decommissioning.
Berkeley	Care & Maintenance due to begin 2009	

Bradwell	Fuel being removed - will take 3 years (2007?)	EIAD approved.
Calder Hall	Fuel being removed - will take 3 years (2007?)	EIAD being prepared.
Chapelcross	Now entering de-fuelling phase, which is expected to take 3 years.	EIAD will be produced
Dungeness A	Will close end 2006	
Hinkley Point A	Fuel removal should be complete by September 2005	EIAD approved.
Hunterston A	All fuel removed.	
Oldbury	Will cease operation end 2008.	
Sizewell A	Will cease operation end 2006	
Trawsfynydd	All fuel removed.	
Wylfa	Will cease operation in 2010	

There needs to be an explanation of various terms used in Section 2.3:-

1. Decommissioning
2. Care & Maintenance
3. De-licensing/closure

We are told, for example, that Berkeley has largely been 'decommissioned' and will enter a period of care and maintenance. But clearly the term 'decommissioned' does not mean that the reactor has been completely dismantled, which is what many people would expect that term to imply.

BNFL's generic strategy for Magnox decommissioning involves a care and maintenance period which begins when the only significant buildings on site are the reactor buildings and an intermediate level waste store. At the end of the care and maintenance period, the reactor buildings and ILW store will have to be cleared if the site is to be delicensed and made available for alternative use. So it appears that there is a further possible stage missing from the life-cycle diagram. This stage might be called "final decommissioning".

5.0 Sellafield MOX Plant

In March 2004, Alan Edwards, former head of the DTI's Liabilities Management Unit,

expressed doubts about whether SMP will ever open⁹ and two months later a BNFL source told *The Independent* that "despite everyone's best efforts, the bloody thing does not work".¹⁰ BNFL has recently been forced to subcontract a 4th MOX order to one of its European competitors because of difficulties in opening the plant.¹¹

In a letter to Michael Meacher MP, Sir John Bourn, the Comptroller and Auditor General (Head of the NAO) says that SMP was originally estimated, in 1993, to cost £265m. The latest figure given in BNFL's accounts for 2003/4 is £490m. In the period between plant construction and commissioning with plutonium, BNFL had to carry out a substantial amount of remedial work. This accounted for approximately half of the increase in costs. The remainder results from the construction of additional facilities and the capitalisation of expenditure on commissioning. In addition the costs of the data falsification scandal to BNFL amounted to £113m – making a total of around £600m.¹²

Despite these ever increasing costs, and the difficulties BNFL has been experiencing getting the plant to work, the Company's assessment is that SMP has sufficient orders to enable it to remain viable, and that it would be much more expensive to close the plant immediately than to continue operating it. However, Sir John Bourne says this is subject to considerable uncertainty, and is particularly dependent on the satisfactory resolution of technical difficulties. He continues:-

"From April 2005, the Secretary of State will be responsible for decisions on the future of the SMP on the basis of advice from the NDA. It is likely that the Government will wish to consider the case for continued operation of this plant as a result of the change in responsibilities".

Rather than revealing the NDA's plans for the open and transparent re-examination of the case for the continued operation of SMP, the Draft Annual Plan simply states that Sellafield will:-

"... produce Mixed Oxide fuel (MOX) in line with agreed contracts".

It is difficult to decide which is more absurd: (a) the cavalier way this statement rides roughshod over the NDA's commitments to an open and transparent process or (b) the way it ignores the technical difficulties being experienced in getting the plant to work. The Draft Annual Plan says efforts to commission SMP will continue, and the NDA hopes to secure consent to operate SMP in November 2005.

The Draft Annual plan also reveals that the NDA's projected income in the 12 months to 31 March 2006 includes £136m generated by the manufacture of AGR and MOX fuel. Although the Plan fails to say how much of this is expected to come from MOX fuel, *The Independent*

⁹ Speaking at the 6th Irish and UK Local Authorities Standing Conference on Nuclear Hazards, Glasgow 25-26 March 2004.

¹⁰ *Independent*, 16 May 2004, '£470m nuclear plant does not work, admits BNFL'.

¹¹ *Nuclear Fuel* (Vol29, No 15, July 19, 2004) "BNFL subcontracts 4th MOX order to make up for SMP delay".

¹² See Ref 1.

on Sunday puts the figure at £45m.¹³

There is no mention of the amount the NDA may pour into getting the SMP operational – yet this should be set against whatever ‘profits’ it is claimed the plant will make.

It is a sad day when an organization which the Government said it was hoping would gain wide public confidence and support must rely on one of the most controversial projects to be built in Western Europe in recent years to provide only around 2% of its budget.

The Draft Annual Plan must be changed to explain how the NDA plans to launch an open and transparent re-examination of the case for the continued operation of SMP. Any plans to actually operate SMP must be made much more tentative and dependent on the outcome of such a re-examination. The Draft Annual Plan should also detail arrangements for developing alternatives to operating SMP.

Plutonium as a waste

The Draft Annual Plan says the NDA will give advice to Government and the Committee on Radioactive Waste Management (CoRWM) on the arrangements for long-term management of radioactive waste or other nuclear materials for which the UK is responsible.

CoRWM is currently examining the question of whether UK stocks of weapons-useable plutonium, mostly located at Sellafield, should be declared a waste. The Annual Plan needs to set out how the NDA will carry out an open and transparent examination of the options for plutonium management.

There is clearly no current requirement for UK plutonium from the owners, and BNFL has already agreed that at least some of its plutonium should probably be declared a waste. The NDA should set out for discussion how it intends to research options, including immobilization, and carry forward the work of the BNFL Stakeholder Dialogue Plutonium Working Group. The previous regime appeared to favour MOX, despite the lack of nuclear reactors in the UK capable of using MOX as a fuel, so it is likely that other options have not been properly developed (see Greenpeace’s response to the Committee on Radioactive Waste Management, attached, on reasons supporting declaring plutonium as a waste).

6.0 THORP

The Draft Annual Plan states that spent fuel will continue to be reprocessed until existing contracts with UK and overseas customers have been honoured.

The White Paper stressed the importance of honouring the overseas contracts 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”* (para 5.18).

¹³ “Nuclear 'white elephant' eyes a profit” By Clayton Hirst, Independent on Sunday, 12 December 2004
<http://news.independent.co.uk/business/news/story.jsp?story=592201>

If the need to honour contracts with overseas utilities is the main concern then the Annual Plan should detail how much overseas and how much UK spent fuel it is hoped will be reprocessed over the coming year.

From around 1st April 2004 only around 1,435 tonnes of overseas spent fuel remained contracted to be reprocessed, plus around 2,910 tones of AGR spent fuel belonging to British Energy. Since the UK Government is expecting to make very large contributions towards the cost of British Energy's decommissioning and nuclear waste management costs, the arguments to justify reprocessing British Energy's spent fuel are now completely different to those used to justify overseas spent fuel reprocessing.

On 26th August 2003 the Guardian reported that THORP would close by 2010.¹⁴ Although the story was later denied by BNFL, the story appeared to come from Brian Watson – Director of Sellafield at the time. BNFL's Press Release in response to *The Guardian* said:-

"The date of 2010 for the completion of current business is not new and has been in the public domain in a variety of documents"

The Financial Times said on 27th August 2003 that a decision to close THORP was expected to be confirmed in Autumn 2003. However, no such decision has been announced. Nevertheless, it seems clear that in the absence of new overseas contracts, THORP will run out of business by around 2010.

However, it is also clear that at a throughput rate of around 700 tonnes per year THORP could complete its overseas work before 2007. A key milestone, which the Annual Plan fails to mention, will be the arrival, at Sellafield, of the last batch of overseas spent fuel covered by current contracts. This is likely to take place this year as the German phase-out plan sets July 2005 as the deadline for transports of German spent fuel to foreign reprocessing plant. Completion of all overseas contracts could occur very soon after that date. A technical and economic case for continuing with reprocessing at THORP after overseas contracts have been completed (probably by the end of 2006) has not been made. This needs to be done urgently with as much financial information being made available as possible otherwise it will be impossible for stakeholders to fully participate in the production of the NDA's Annual Plan for 2006/7.

The Draft Annual Plan should be amended to reflect the need for an open and transparent examination of the technical and economic case for continuing to reprocess UK spent nuclear waste fuel. Alternatives to reprocessing are technically feasible and are employed in a number of countries – and will be used by BE for the PWR fuel from Sizewell. The NDA should demand BNFL provide a strategy for storing rather than reprocessing BE's spent fuel.

7.0 Miscellaneous

¹⁴ Sellafield Shutdown ends Nuclear Dream, by Paul Brown, Guardian 26th August 2003.
http://www.guardian.co.uk/uk_news/story/0,,1029333,00.html

Paragraph 3.3.1 briefly mentions, inter alia:-

- (a) development of a nuclear material disposition strategy;
- (b) development of high volume low activity waste (HVLAW) disposal and
- (c) contaminated ground remediation and site end point determination.

Decommissioning nuclear facilities and decontaminating nuclear sites are going to generate huge volumes of lower level nuclear waste, which are not being considered in the CoRWM process. The Radioactive Waste Management Advisory Committee, which has now been put in abeyance by the Government, while CoRWM is in operation, has complained that these issues are not being addressed.¹⁵

It is Greenpeace's view that Government policy on dealing with lower level waste is in disarray. There is sufficient lower level waste likely to arise from decommissioning to fill Drigg many times over, and although it is currently assumed that Drigg will remain open until 2030-2050, it could close earlier. Non-Drigg disposal options for lower level waste include the use of landfill sites and incinerators. These have both proved to be extremely controversial. The 1995 Review of Radioactive Waste Management decided not to encourage greater use of landfill because of opposition from local authorities and the public,¹⁶ and the Environment Agencies (EA and SEPA) have indicated an unwillingness to encourage the extension of this practice.¹⁷ Public opposition has also prevented the commissioning of LLW incinerators at Bradwell and other nuclear sites. This has resulted in the near cessation of incineration operations by the nuclear sector.

However, it is not the role of the NDA to develop policy – even if the Government has left a vacuum by its indecision. If the NDA attempts to develop or influence policy - by its actions - in a piecemeal fashion, in the absence government direction, this will simply fuel controversy and lead to further confusion. The NDA should not be developing proposals to “dispose” of high volume low activity waste in the absence of a clear Government policy. The NDA should advise the Government of the need to develop a clearly defined policy, in consultation with stakeholders, on the standards of clean-up required for nuclear sites following decommissioning.

Waste

Paragraph 3.3.1 states that the NDA are in discussions with Nirex about a possible contract for R&D related to their phased disposal concept for the long-term management of nuclear waste. However, there is no mention of commissioning R&D work related to other waste management options. Commissioning work on only one option is in danger of pre-empting the recommendations of the Committee on Radioactive Waste Management (CoRWM). Greenpeace has attached its response to the CoRWM document: 'The Options for Long-

¹⁵ Radioactive Waste Management Advisory Committee (September 2004) “Review of current issues and priorities in radioactive waste management” <http://www.defra.gov.uk/rwmac/reports/issues/rwmac-issues.pdf>

¹⁶ HMSO (1995) ‘Review of Radioactive Waste Management Policy: Final Conclusions’ Cmnd 2919, para 180

¹⁷ Clive Williams of the Environment Agency speaking to the Local Government Association Special Interest Group on Radioactive Waste Management & Nuclear Decommissioning in May 2004.

Term Management of Higher Active Solid Radioactive Wastes in the United Kingdom.’

British Energy

On BE, rather ominously, the Annual Plan says the NDA is responsible for:-

“Confirming that certain increases in BE’s nuclear liabilities arising from changes in its operations are appropriate to be funded through the Nuclear Liabilities Fund (NLF)”

This statement requires further explanation.

8.0 Environmental Principles

The Draft Annual Plan would have been an ideal opportunity to set out the environmental principles to which the NDA will seek to adhere. (The Principles which Greenpeace believes the NDA should apply are detailed in the Annexes).

The NDA has a duty to have particular regard to the need to safeguard the environment, yet there is almost no mention in the Draft Annual Plan about how it intends to carry out this duty.

For example, there is no mention of how the NDA will meet its commitment to progressive and substantial reductions in radioactive discharges, as required by the UK Radioactive Discharges Strategy. An application for new discharge authorizations for Dounreay will be subjected to public consultation during 2005. According to the Scottish Environment Protection Agency (SEPA), the application should give detailed information on all decommissioning projects (and any other activities) that UKAEA envisages taking place over the next 5 years and as much information as possible on projects that are planned for years 5 to 10.

The NDA should declare its intention to ensure that decommissioning does not automatically lead to, or be used as an excuse for, increases in radioactive discharges into the environment. It should state its intention to give details of individual decommissioning project at every site, not just Dounreay, and to subject each project to a Best Practicable Environmental Option (BPEO) Process. This means the NDA should be preparing decommissioning strategies with the need to reduce radioactive discharges into the environment in mind, and taking into account international developments in best practice.

8.0 Conclusion

The NDA’s Annual Budget is around £2.2bn. Of this around £0.7bn or 32% will be spent on operating waste producing facilities at Sellafield, and a further £0.26bn at the operating Magnox stations. By presenting these activities as a fait accompli, rather than as activities which now require to be justified in an open and transparent process, the Draft Annual Plan severely damages the credibility of the Nuclear Decommissioning Authority. The operation of

THORP, SMP and the Magnox cycle needs to be made much more tentative in the Annual Plan and details should be set out about how the NDA intends to carry out an open and transparent examination of the technical and economic justification for the continued operation of these facilities.

ANNEX ONE.

ENVIRONMENTAL PRINCIPLES FOR RADIOACTIVE WASTE MANAGEMENT

26th April 2004

Introduction

The UK nuclear industry, its regulators, government agencies and policy advisory bodies have in recent years attempted to change policies and activities related to nuclear waste management. Many of these have failed in gaining public support. This lack of confidence is, Greenpeace believes, due primarily to the fact that the policies and their implementation are not based on clear environment principles.

Current policy on nuclear waste management is based on a 1995 document¹⁸ - this assumed a deep geological repository would proceed. That in itself (as will be discussed below) would have breached a number of key principles that the environment movement, with public support, has been arguing for i.e. the dump was an attempt at a 'solution' without the principle of waste minimisation/avoidance being discussed. The whole process behind the NIREX dump proposal was not informed by environmental principles. Had it been, a clearer path for dealing with radioactive waste may have emerged that may have gained public support.

As it is, at present the UK's nuclear waste system is in disorder, with policy being made 'on the hoof'.¹⁹ In an effort to break some of the impasse, the Radioactive Waste Management Advisory Committee (RWMAC) has called for a review of the principles underlying the regulatory system.²⁰ But policy is slowly being re-written, without underlying environmental principles. Proposals are appearing piecemeal, objectives are contradictory, priorities unclear, and policy often so vague that regulators and nuclear operators can take from it what they wish.

The decisions in the last two years put RWMAC in abeyance, establish the Nuclear Decommissioning Authority (NDA), continue with NIREX (with its very limited remit) and set up the Committee on Radioactive Waste Management (CORWM) underline the scatter gun approach to nuclear waste issues by Whitehall. At the time of writing at least five other consultations are ongoing, all dealing with small parts of policy, revealing a lack of 'joined-up government'. Westminster is not well-served by this

Ministers refusal to include underlying environmental principles in the Energy Bill, which will establish the Nuclear Decommissioning Authority (NDA) adds to concerns about the Government's real agenda on this issue – are financial considerations, or nuclear revival, really driving the nuclear waste agenda rather than protection of human health and the environment? Similarly, accommodating future plans for waste creation under military activities (to which these principles should also apply) means that best environmental practice is not being followed.

If new policies are to inspire public confidence, and have the affect of protecting human health and the environment there should be a clear set of environmental principles underpinning all future activities. Once these are agreed, discussions on updating the regulatory system and nuclear policies can take place. It is in this spirit that GP offers the following for discussion. These principles are not set in stone, but are, we believe, a start in laying the foundations upon which any good nuclear waste policy

¹⁸ Review of Radioactive Waste Management Policy: Final Conclusions. HMSO (1995). Cm2919.

¹⁹ RWMAC (March 2003) Management of Low Activity Solid Radioactive Wastes within the United Kingdom. Para A3.21

²⁰ RWMAC 23rd Annual Report para 3.13

and programmes should be based. The principles are not in a particular order of priority - priorities will differ depending on the wastes being dealt with.

Environmental Principles – the key objective

This document outlines the environmental principles Greenpeace believes should underlie all Government policy, nuclear regulation and activities. The combined objective of these principles is:-

to maximize protection of human health and the environment from the harmful effects of radiation in all operations involving the production or management of radioactive materials and waste.

(1) The Waste Minimization/Avoidance Principle

Definition: The creation of radioactive waste (solid, liquid and gaseous) should be minimized.²¹ First and foremost this means we need to stop producing more nuclear waste; nuclear power stations need to be phased-out as quickly as possible, and reprocessing, which magnifies the waste problem, should end. Existing waste management and the decommissioning of nuclear facilities needs to minimise the production of new waste during their operations.

Example of current policy failures: The NDA will allow the continued operation of waste-producing facilities e.g. the THORP reprocessing plant at Sellafield. It should instead get on with the job it was originally thought of for which is to focus “squarely on [dealing with] the nuclear legacy”²², not on generating new nuclear waste which will exacerbate current problems.

(2) The Passively Safe Principle.

Definition: Radioactive material in existing waste should be immobilized in a stable chemical and physical form utilizing Best Available Technology (BAT), so that the need for maintenance and human intervention is minimized. Waste stores should be monitored and waste should be capable of being retrieved from storage for further remedial action or repackaging if necessary.²³

Example of current policy failure: RWMAC says 88% of Intermediate Level Waste (ILW) is stored in a potentially dangerous condition - some in 40-50 year old buildings.²⁴ ILW remained largely untreated prior to 1997 because it was thought best to delay treatment and packaging in case a particular form of treatment proved incompatible with the characteristics of a future underground dump.²⁵ Although a dump is unlikely to happen (if ever) within decades, ILW continues to be stored in hazardous conditions.

(3) The Reversibility Principle.

Definition: Allied to the passively safe principle is the principle that any waste management technique

²¹ From DEFRA (2000) Statutory Guidance on the Regulation of Radioactive Discharges into the Environment from Nuclear Licensed Sites: Consultation Paper.

²² DTI (July 2002) Managing the Nuclear Legacy: A Strategy for Action, para 1.12

²³ See for example: HSE Nuclear Safety Directorate (13/03/01) Guidance for Inspectors on the Management of Radioactive Materials and Radioactive Waste on Nuclear Licensed Sites. Appendix 4.

²⁴ RWMAC & NuSAC (June 2002) Current arrangements and requirements for the conditioning, packaging and storage of Intermediate Level Radioactive Waste.

²⁵ Environment Agency Guidance on the Conditioning of Intermediate Level Waste

needs to be reversible. Given the uncertain state of scientific knowledge of the way radionuclides behave in the environment and their impact on the health of humans and other biota, it is important to be able to retrieve radioactive waste to take account of any unexpected changes in conditions and prevent detrimental impacts on the environment.

Example of current policy failure: Plutonium discharged to the Irish Sea from Sellafield was expected to remain bound to sediments mainly within the Irish Sea region. However, recent studies have shown that this plutonium is potentially more bioavailable than hitherto believed.²⁶ Plutonium is now being found on the Eastern Scottish and Norwegian coasts.²⁷

(4) The Concentrate and Contain Principle

Definition: Where possible gaseous and liquid radioactivity should be trapped instead of being discharged from a nuclear facility, and then concentrated, immobilised, and stored as a solid waste. This is far preferable to releasing gaseous or liquid radioactive wastes into the environment – the so-called dilute and disperse approach. If possible, advantage should be taken of radioactive decay to reduce levels of radioactivity by keeping wastes in storage as an alternative to increasing or continuing discharges.

Example of current policy failure: Draft Guidance to the Environment Agency (EA)²⁸ says “*the unnecessary introduction of radioactivity into the environment is undesirable, even at levels where the doses to both humans and non-human species are low, and on the basis of current knowledge are unlikely to cause harm*”. However, the UK Strategy for Radioactive Discharges 2001-2020 accepts that some discharges may increase as a consequence of decommissioning. At Springfields Nuclear Fuel Fabrication Plant, BNFL is planning to ‘decontaminate’ some equipment, and scrap metal²⁹ leading to totally unnecessary increases in discharges. Decommissioning should not automatically lead to, or be used as an excuse, to increase radioactive discharges into the environment.

(5) The Hazard Prioritisation Principle.

Definition: The magnitude of the radioactive hazard should influence the timing of the implementation of passive storage and immobilisation. High Level Waste (HLW) in a liquid form represents one of the most significant radioactive waste hazards in the UK (if not the most hazardous) and should be placed in a passively safe state as soon as possible.³⁰

Example of current policy failure: Solidifying the liquid, heat-generating HLW at Sellafield and Dounreay is the most urgent step required to reduce the hazard of existing waste. Extremely dangerous liquid HLW must be constantly cooled. If just 50% of the HLW stored in tanks at Sellafield were to escape due to an accident or malicious act, the radioactive plume could be equal to 44

²⁶SNIFFER (August 2003) “Studies on the solid speciation and remobilisation of plutonium in northern Irish Sea waters” AIR(99)01 <http://www.sniffer.org.uk/>

²⁷ New Scientist 27th February 1999. By Rob Edwards; Sellafield waste poisoning the east coast, says study. Sunday Herald 4th April 1999. By Rob Edwards; Now you see it... It's official: some of Sellafield's plutonium is missing. New Scientist 24 April 1999. By Rob Edwards

²⁸ DEFRA (2000) Statutory Guidance on the Regulation of Radioactive Discharges into the Environment from Nuclear Licensed Sites: Consultation Paper. The Scottish Executive has yet to publish a similar draft document for the Scottish Environment Protection Agency.

²⁹ BNFL submission to the Environment Agency’s Review of Springfields Radioactive Discharge Authorisations. Sect. 3

³⁰ HSE Nuclear Safety Directorate (13/03/01) Guidance for Inspectors on the Management of Radioactive Materials and Radioactive Waste on Nuclear Licensed Sites. Appendix 4.

Chernobyls in terms of radioactive release.³¹ The Nuclear Installations Inspectorate (NII) has ordered BNFL to reduce stocks to a buffer level by 2015.³² This timetable is too lengthy, as is the UKAEA's plan to deal with Dounreay's HLW around 2010.^{33 34}

(6) Sustainable Development and Intergenerational Equity

Definition: Development which meets the needs of the present without compromising the ability of future generations to meet their own needs and that of environmental protection.³⁵

Example of current policy failure: Nirex's sustainability principles³⁶ say that we should seek to minimise the further burdens imposed on this, and future generations for the management of radioactive waste. Our scientific understanding is not sufficiently advanced to be able to predict the impact of underground nuclear waste dumping on human health or the environment. The concept relies on diluting and dispersing waste in groundwater, rivers and the sea – it is not nuclear waste containment. It would be more responsible to bequeath future generations a well-managed, monitorable retrievable waste store than a waste dump from which radioactive materials will eventually return to the surface. A nuclear waste dump with all its potential problems is, therefore, not a way to protect future generations from problems arising with radioactive wastes. The most sensible way to reduce further burdens on present and future generations would be to stop creating more nuclear waste now by closing existing facilities as soon as possible.

(7) The Polluter Pays Principle

Definition: Nuclear operators producing waste should pay for its management. Because much of the waste doesn't arise until after the facility has closed and stopped producing an income and because of the longevity of the wastes created during operations (e.g. spent nuclear fuel), operators need to accumulate adequate funds, in a segregated account, over the lifetime of the facility for long term management. Private sector problems should not become public sector problems - taxpayers should not be expected to shoulder the ever-increasing financial burden of wastes from the private nuclear sector. Similarly, Government owned entities should not assume that the taxpayer should continue to fund the management of their ever-increasing waste stockpiles.

Example of current policy failure: BE's segregated fund proved insufficient to fund its liabilities. The Government is taking financial responsibility for around £3.3bn of its waste management & decommissioning costs. The Energy Bill, currently passing through Parliament, would be an ideal opportunity to ensure the taxpayer doesn't end up paying for similar liabilities in future. Unfortunately the Government is refusing to do this. The provisions in the Bill to allow the BE rescue are written generally so if "*... a private sector operator cannot meet its nuclear obligations [the Government] retain[s] the possibility of ... meeting such costs.*"³⁷ Further, the Government has also said that other private nuclear operators may need to be bailed out for their liabilities and decommissioning and has provided for this in the Energy Bill.

³¹ European Parliament, Scientific and Technological Options Assessment (November 2001) Possible Toxic Effects from the Nuclear Reprocessing Plants at Sellafield (UK) and Cap de La Hague (France). Para 5.5

³² HSE (Feb 2001) Progress on BNFL's Response to Three Reports issued by HSE on 18th February 2000.

³³ RWMAC (September 2001) Advice to Ministers on the Restoration of the UKAEA Dounreay Site.

³⁴ RWMAC (December 2003) 23rd Annual Report.

³⁵ See http://www.sustainable-development.gov.uk/what_is_sd/what_is_sd.htm

³⁶ Nirex (December 2000) Managing Radioactive Waste.

³⁷ Lord Whitty, House of Lords, 15th January (Column GC170)

(8) The Precautionary Principle

Definition: Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.³⁸

Example of Current Policy Failure: Uncertainties in estimates of radiation doses and the risks associated mean a precautionary approach to discharging radioactivity into the environment should be followed. The Draft Guidance on Radioactive Discharges to the EA says:-

“The principle of ‘progressive reduction’ is a central tenet of the way in which radioactive discharges should be controlled. It takes primacy over other considerations, apart from safety ...”

Yet the EA’s proposed authorisations for Sellafield will allow BNFL to increase discharges, compared with 1998, (apart from Technetium-99), so that BNFL can increase the throughput of its two reprocessing plants until around 2010.³⁹

(9) The Proximity Principle

Definition: Radioactive waste should, as far as is compatible with the safety of the management of such material, be managed in the State in which it was generated. There should be no international trade in waste. Within States waste should be managed as close as possible to where it is produced to avoid unnecessary transports.⁴⁰ This, however, should not be taken to condone the Government’s policy of substitution.

Example of current policy failure: The Environment Agency’s (EA) policy is that waste with an authorised disposal route should be disposed of as soon as possible.⁴¹ Yet the 1995 policy⁴² says waste should be “*disposed of at appropriate times and in appropriate ways ... in a manner that commands public confidence*”, and the Government’s proposed decommissioning policy accepts that waste may need to be stored until long-term solutions are available.⁴³

This EA policy, which is also being applied by the Scottish Environment Protection Agency (SEPA) and the Nuclear Installations Inspectorate (NII), is leading to, for example, the unnecessary transfer of low-level waste from Dounreay to Drigg in Cumbria. This may well set an unhealthy precedent for the future management of intermediate and high-level waste on the Dounreay site.⁴⁴

(10) The non-proliferation principle

³⁸ Nearly 180 countries met at the 'Earth Summit' in 1992 (UN Conference on Environment and Development) in Rio de Janeiro to discuss how to achieve sustainable development. The Summit agreed the [Rio Declaration on Environment and Development](http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm) (<http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>)

³⁹ See for example Figure 7 in Appendix 1 of the UK strategy for radioactive discharges.

⁴⁰ See Article 130R(2) of the Single European Act

⁴¹ Environment Agency (September 2002) Decommissioning Of Nuclear Installations: The Environment Agency’s Role And Objectives.

⁴² HMSO (July 1995) Review of Radioactive Waste Management Policy Final Conclusions.

⁴³ DTI et al (November 2003) A Public Consultation on Modernising the Policy for Decommissioning the UK’s Nuclear Facilities.

⁴⁴ RWMAC (2003) para 6.14

Definition: All plutonium and highly enriched uranium stocks should be declared wastes and all necessary steps should be taken to prevent their use in, or availability for use, in nuclear weapons. These wastes should be immobilised in waste forms that would make their recovery for use in weapons virtually impossible. This should take into account not just diversion to nuclear weapons programmes by government, but also the threat of terrorism. Real security cannot be achieved by armed guards, but requires removal of the threat by ending the further separation of plutonium and the production of enriched uranium.

Example of current policy failure: BNFL has contracts to supply plutonium (MOX) fuel to utilities in Germany, Switzerland and Sweden, and is seeking contracts with Japanese utilities. This will involve transporting weapons-useable plutonium over long distances. Plutonium can be separated from MOX relatively easily.⁴⁵ BNFL is researching various plutonium immobilisation technologies, but this work may stop when the NDA is established. Work on immobilising all stocks of civil and military plutonium should be one of the priorities of the NDA when it is established.

(11) International Best Practice.

Definition: The most effective processes (including clean technology) and long-term containment of existing nuclear waste should be used to prevent radioactive pollution of the environment. This should not be about end-of-pipe solutions, but should investigate whether the industry is using the right products and processes in the first place. Decisions on waste management should be based on an assessment of alternative options and should involve the public in their evaluation – this cannot be left to scientists and regulators alone.⁴⁶

Example of current policy failure: The UK Government has failed to look at clean technology (for example dry storage) for spent fuel management as an alternative to reprocessing. Over its remaining life the throughput of the Sellafield Thermal Oxide Reprocessing Plant (THORP) will be dominated by reprocessing spent fuel from BE's reactors. This fuel can readily be dry stored – it does not have to be reprocessed. BE has previously called for an end to its reprocessing contracts⁴⁷, but the Government has chosen instead to subsidise BE's contracts with BNFL, thus allowing for continued reprocessing.⁴⁸

Pete Roche and Jean McSorley

If you have any comments on these principles please contact Jean McSorley, Nuclear Campaign Coordinator, Greenpeace UK (jean.mcsorley@uk.greenpeace.org) and Pete Roche, consultant to the Nuclear Campaign (rochepete8@aol.com)

⁴⁵ US DoE Office of Arms Control and Non-proliferation (January 1997) Non-proliferation and Arms Control Assessment of Weapons-Useable Fissile Material Storage and Excess Plutonium Disposition Alternatives. P84

⁴⁶ RCEP (1998) The Twenty First Report, Setting Environmental Standards. (<http://www.rcep.org.uk/studies/standards/s-chap9.htm#top>),

⁴⁷ Nucleonics Week (2001) BE Blames Reprocessing Charges for Higher UK Operating Costs. Vol. 42 No. 46. 15th November.

⁴⁸ See for example “Taxpayers pick up reprocessing bill in £2 billion British Energy bail-out” ENDS Report December 2002

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ANNEX TWO

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Response to the Committee on Radioactive Waste Management report **'The Options for Long-Term Management of Higher Active Solid Radioactive Wastes in the United Kingdom.'**

SUMMARY

Greenpeace welcomes the opportunity to respond to the above report (Options report). Greenpeace also notes the 'Preliminary Report on in the Inventory' (the Inventory) which CoRWM has also published and provides some brief comments on this. In brief Greenpeace's views are:

- The options listed as suitable for the proposed preliminary short list (published since the Options document was released) are: interim storage; deep disposal and phased deep disposal. This listing does nothing to assuage concerns that the Committee is leaning heavily towards disposal *before* other options, such as indefinite storage, as given full consideration.
- Greenpeace notes that interim storage is inevitable as some of the wastes currently held are in no condition to be assigned to disposal – and also a nuclear dump site is not expected to be operational for at least 30-40 years. Given this might become a main option recommended by the Committee; it should define what is meant by 'interim' storage.
- The issue of interim storage notwithstanding, deep disposal appears to be favoured as the main option - primarily because of the amount of research already done in this area. The large amount of research on disposal is due mainly to the fact that the nuclear industry had a preconceived idea in the 80s that this was *the* solution. The subsequent 1997 inquiry on NIREX's repository proposal revealed that the science did not meet the expectations of the industry. Concerns raised in 1997 over NIREX's proposal remain today. The continued lack of certainty over the deep disposal option means then that indefinite storage might result through default rather than by design. To prevent indefinite storage happening by default - with the risk, for example, that wastes stored are not conditioned to the best standard for indefinite storage - CoRWM should include indefinite storage on the preliminary short list for further investigation to ensure it receives as much research as the disposal option.
- The Committee should also recommend that plutonium, uranium and spent fuel be designated as wastes and should also recommend against any new nuclear build program. Burning plutonium or uranium stocks in reactors, creating more spent fuel through operating new reactors and continued reprocessing of spent fuel will only serve to continue or exacerbate the problem of nuclear waste (in terms of volume and/or radioactive content of the wastes which have to be dealt with) for which it, the Committee, has no 'solution.' All of the above also breach the criteria set by CoRWM but also the environmental principles Greenpeace has submitted to the Committee (see appendix 1).

- It should improve the inventory to fully explain the different types of waste and the implications (for future generations) of wastes created from a new build programme e.g. a proposed programme of 10 reactors would mean doubling the amount of spent fuel the UK would have to deal with.

POLICY CONTEXT

Future waste creation: CoRWM has been charged with a very significant task: that of finding a 'solution' to the more highly radioactive waste materials currently in the UK. As is common knowledge, the search for a 'solution' foundered in 1997 when NIREX was refused permission to build an underground laboratory as a precursor to a national nuclear dump. There were both scientific and social reasons behind this decision to reject the proposal.

In terms of the social concerns, there was (and still is) a keen public awareness that the public may be urged to accept a 'solution' – one perhaps with many compromises and uncertainties attached – while the Government and nuclear industry continue to allow or promote activities which create more wastes. The public will not be coerced into accepting a 'solution' for hazardous substances (particularly on claims over environmental or security reasons) if the industry creating those substances is hell bent on creating more.

The public is well aware that the industry's claim there are environmental/security imperatives to 'solving' the waste problem (i.e. by disposing of it deep underground) are totally contradicted by its proposals to allow for waste creating activities like reprocessing or new nuclear reactors. This has naturally led to a lot of public scepticism around this debate.

The Committee too is aware that a recommendation to dump wastes will be seen as a green light by the nuclear industry to push for more reactors and to support future reprocessing contracts (with the possibility of more ILW staying in the UK under the recently announced substitution policy).

Were CoRWM not aware of the industry's plans for new build then it could plead that if recommending disposal leads to a push for new build then that would be an unintended *and* unforeseen consequence of its decision. As it is, the Committee is well aware of that nuclear industry's plans for new build are predicated on finding a 'solution' for nuclear waste – preferably deep disposal. Thus if CoRWM recommends deep disposal it will do so in the full knowledge that a push for new build by the industry was not unforeseen, albeit that it might be an unintended consequence.

CoRWM has to ask itself if it is reasonable to ask the public to accept a 'solution' (a deep disposal site) - on questionable scientific 'evidence' - if the activities giving rise to nuclear waste and its attendant environmental and security concerns are going to be continue for decades to come?

Setting a boundary: In addition to the political dimension of how the industry will react to CoRWM's recommendations the Committee has to be seen to take itself seriously. At present the Options document and the Inventory acknowledge there may be issues (and extra waste)

associated with new build or future reprocessing. But neither of these documents says anything about whether these are acceptable in terms of what the Committee is setting out to do i.e. find an *acceptable* waste management solution that meets the needs of all stakeholders. In this context, CoRWM has failed particularly in terms of the discussion around the amount of radioactive material to be dealt with, in not setting a boundary around the amount of waste that has to be managed or disposed of.

The issue of recommending against future waste creation activities is something CoRWM will have to consider in its deliberations. In this respect it will also have to be mindful that the soon-to-be-established Nuclear Decommissioning Authority (NDA) will also create more waste and will not – as originally thought – simply get on with tackling legacy waste issues.

Recommendation: Greenpeace advises that CoWRM should recommend against a new build programme on the basis that such a programme would simply continue to add to what the Committee, the Government, the public – and even the nuclear industry – all agree is a major problem. In conjunction with this CoWRM should recommend against the use of plutonium or uranium as fuel for reactors. To take relatively non-radioactive substances and use them in a reactor – a hazardous process in itself – could only be construed as reckless. These materials would only be converted into highly radioactive spent fuel – which would continue to present a risk to future generations and provide security problems (this is also dealt with further under the Burning in Reactors p 8 of this response).

Setting a boundary on the amount of waste that has to be dealt with and/or taking action to prevent or minimise further waste creation is one of a number of crucial steps in the process of addressing the issue of what to do with radioactive waste.

Is there a solution waiting to be found? Another major issue is whether the science behind any of the options is water tight. Is there is a ‘solution’ to nuclear waste ready to hand that can be recommend with certainty? CoRWM acknowledges there is probably not a one-size fits all solution to nuclear waste – because of the many different characteristics of the different materials being discussed. There may be a ‘solution’ for some wastes. However, for the more problematic wastes such as high level waste, spent fuel, plutonium – as with other intractable wastes created by modern society - there may not necessarily be a ‘solution’ that can be applied to them which CoRWM will feel able to recommend within the time allotted to it. This is why there is such concern in particular over the seeming rush by CoWRM to examine deep or phased deep disposal at the expense of other options – which are options not solutions. Indeed, disposal may not be a solution but a cop-out, where out-of-sight out-of-mind is passed off as a scientific certainty and, therefore, somehow environmentally acceptable.

In the case of the more highly radioactive wastes Greenpeace believes that at present there is no environmentally, socially, ethically or totally scientifically acceptable method of waste disposal. In fact there are many questions even over the disposal of low level wastes, many of which have been proven to be wrong in the past (witness recovery and reconditioning of some of the wastes at Drigg and Dounreay which were previously thought to have been safely disposed of).

As noted earlier, CoRWM looks to be leaning in favour of deep disposal – because of the

amount of research already undertaken on this option. That has only come about because that was the option targeted by the nuclear industry. As CoRWM knows, the decision to spend huge amounts on research into deep disposal was predicated mainly on a political imperative by the nuclear industry to be seen to have a 'solution' to its waste problems so it could continue making more of the same. As we also know, the scientific research did not result in findings which supported the deep disposal option. Whether more money and research thrown at the deep disposal option will resolve this issue once and for all time is highly questionable. As the Royal Commission on Nuclear Power and the Environment quoted in 1976 'If a problem is too difficult to solve, one cannot claim that it is solved by pointing to all the efforts made to solve it.'⁴⁹

Greenpeace is concerned that because the nuclear industry has spent so much money on the deep disposal/phased deep disposal option for waste that other options (such as indefinite above ground storage) are at risk of being 'dumped' at a very early stage. There is a danger CoRWM will advocate deep disposal at a time when the science is still uncertain. True, the same might hold for above ground indefinite storage. However, this has been the subject of very little research and needs a lot more examination.

Recommendation: Greenpeace recommends the Committee place the option of indefinite storage (long term, above ground storage) on the preliminary short list for further examination.

CRITERIA and PRINCIPLES

CoRWM list of options are to be judged based on the following criteria

1. There is no proof of concept in the form of a) actual implementation of the option in the UK or elsewhere, or evidence of ability to achieve implementation within the foreseeable future b) sufficient research and development on the part of the international scientific community to demonstrate confidence that the option can be implemented.
2. It causes us to breach our duty of care to the environment outside national boundaries. It causes harm to areas of particular environmental sensitivity.
4. It places an unacceptable burden (in terms of cost, effort, or environmental damage) on future generations.
5. It involves a risk to future generations greater than that to the present generation that has enjoyed the benefits.
6. It results in unacceptable risk to the security of nuclear materials.
7. It poses unacceptable risk to human health.
8. Cost is disproportionate to the benefits achieved.
9. It breaches internationally recognised treaties or laws and there is no foreseeable likelihood of change in the future.

Greenpeace has provided CoRWM with a copy of the environmental principles it believes should be applied to nuclear waste management. These are provided in Appendix 1 of this

⁴⁹ Hannes Efvén, Energy and Environment, Bulletin of the Atomic Scientists, May 1972, quoted in the Royal Commission on Environmental Pollution Sixth Report Nuclear Power and the Environment September 1976.

submission. Greenpeace believes that whatever options remains on the shortlist following this round of consultation should be subject to the environmental principles it has provided (Appendix 1).

SPECIFIC OPTIONS

There are several options which Greenpeace believes should be abandoned by the Committee immediately as being impractical because of environmental or social/ethical reasons. Some of these have already been discarded by CoWRM. These are:

- disposal in ice sheets;
- disposal in subduction zones;
- direct injection;
- disposal at sea; and
- dilute and disperse.

Greenpeace agrees with the decision to discard these options. Several of them fail the criteria set by CoWRM (e.g. disposal at sea would be in breach of international treaties) and Greenpeace's environmental principles (e.g. dilute and disperse does not meet the concentrate and contain principle). Greenpeace also opposes any option which would see wastes exported from the UK. All wastes created in the UK should be dealt with in the UK. Apart from the ethical and political considerations of using another country to either store or dispose of radioactive waste created here, it is highly likely any move to send wastes overseas would be in breach of international conventions to which the UK is a signatory.⁵⁰

Discussion on options kept on the list by CoWRM:

These fall into two categories as given by CoWRM⁵¹ (see press release):

Needs more discussion to finalise decision:

- Disposal in space
- Sub sea disposal
- Indefinite storage
- Near surface disposal

Proposal to keep on preliminary shortlist

- Interim storage
- Deep disposal
- Phased deep disposal

Disposal in space should be discarded for the same reasons as those given for rejecting those options already rejected. Similarly sub-sea disposal should be rejected for the same

⁵⁰ IAEA's Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management <http://www.iaea.org/Publications/Documents/Infciircs/1997/infciirc546.pdf>

⁵¹ Nuclear Waste Options Reduced, CoWRM's first thoughts on rough short list, Friday 2 November 2005. CoWRM

reasons.

Options for further consideration

Above ground interim storage/Above Ground Indefinite Storage

It is difficult to divide these two options as there is no agreed definition on what is 'interim.' Greenpeace is concerned that above ground 'interim' storage' might be down played in some quarters in order to push for deep disposal – the preferred option of the nuclear industry.

However, as the Options document notes, there are good reasons for allowing for longer-term storage (albeit interim) as this will allow for the science of nuclear waste encapsulation and management to be improved. Interim storage is seen as some as been unacceptable as it does not represent a solution – although as CoRWM notes, 'interim' storage may become indefinite by default. Rather than wait for that to happen by accident; to prevent disposal happening because of concerns over the meaning of 'interim' - and also avoid a rush to dispose of wastes when there are so many uncertainties over immobilisation, types of waste and volume, the option of storage should be taken through both as an interim measure (because it is inevitable) along with the indefinite storage 'option' because this may be what will happen and should be planned for accordingly (indefinite storage is already the preferred option of a number of environment groups).

Interim storage: Given that interim storage is unavoidable for many types of waste it is hardly surprising that the Committee has suggested putting this on its proposed short-list. Interim storage should therefore not be described as a "do nothing" option. There are large quantities of waste which are currently stored inadequately, and need to be placed into 'passively safe' storage. Even where 'interim storage' is implemented on a 'wait and see' basis, it should be done in such a way which keeps all options open for the future. One of those options would be continued/indefinite storage. One of the questions CoRWM will have to answer is whether, if interim storage is chosen solely as the interim option must this then be followed by disposal as the next option in line?

Indefinite storage: Greenpeace believes it would be wrong to assume that deep disposal or phased deep disposal are any more worthy of a place on the short list than indefinite storage. It is known that the timeline for the building of a deep repository is estimated at 30-40 years hence – assuming it is ever built. For wastes to be kept in the safest condition possible it would be sensible to assume that they should be conditioned with indefinite storage in mind – precisely because a deep disposal option can't be guaranteed. Such an option would, hopefully, prevent wastes conditioned for 'interim' storage having perhaps to be reconditioned for 'deep disposal.'

There are bound to be criticisms that 'indefinite storage' is not as well known, in terms of the science of conditioning and management, as the deep disposal concept. But deep disposal is not a 'proven' option either. The push behind deep disposal research was primarily political and undertaken on the assumption that the science would validate this idea. That didn't happen. The industry's proposal was an expensive gamble not only on scientific certainty, but

also on social, financial, political and ethical support for an option which did not enjoy broad support.

Many of the criticisms levelled in relation to indefinite storage can also be levelled at deep disposal. For example, 'what happens if future generations choose not to continue with this option' could also be asked of deep disposal? Should we be taking irreversible steps now to dispose of wastes when there are uncertainties we may be leaving for future generations? At what point can we be sure a waste management route is *the* right route? What if compromises have to be made? And if the public is asked to accept compromises to deal with a problem now – how can the nuclear industry be allowed to promote activities which create more of the same problem.

Another point in relation to storage that CoRWM has to answer is that why, if it chose storage, it would have to decide now on any new stores that might be needed when old/current stores reach the end of their lifetime? Since storage facilities are unlikely to have a life beyond around 100 to 150 years, there is very little difference between the Interim Storage option and the Indefinite Storage option beyond deciding what happens in the next immediate step that should be taken.

Underground interim and underground indefinite storage: It is highly unlikely an underground storage site would be built near surface. If such options were progressed it is more likely they would be seen as an option either as part of deep disposal or phased deep disposal – on the basis that neither a deep disposal site nor a phased deep disposal facility would be opened and closed very quickly. In this case 'storage' would be seen as part of a disposal system that initially would have monitoring and retrievability built in. It is highly unlikely that such an option would be recommended on cost grounds alone (issues of environmental acceptability etc. notwithstanding).

Recommendation: Greenpeace recommends that the above-ground storage option is taken forward to the next stage of the CoRWM process. To continue only with interim storage (inevitable) and deep or phased deep disposal (not inevitable) would be wrong. The indefinite storage option should be placed on the preliminary shortlist and subjected to the same investigation, and scrutiny, as the other options proposed for that short list.

Stores would be designed to be as strong and long-lasting as possible – with specific attention given to making them as 'terrorist proof' as possible. Waste conditioning and storage should be designed so that waste could easily be transferred to either new stores or some other management option at the end of the life of the original stores. An important part of this option is that research programmes should be implemented into the best way of containing nuclear waste into the far future, both above and below ground. Equally important is that sufficient funds need to be put into segregated accounts by waste producers to finance future waste management operations. Finally, none of the "screening criteria" would remove this option from the list.

Underground Storage

Near surface disposal

Greenpeace would note that if promoting this option is premised mainly on it being a 'secure' half way house between the uncertainties of storage and the uncertainties over disposal then that would be false premise for an industry which continues to create many security issues above ground.

Many of the types of waste that need to be managed would not be suitable for near-surface disposal. This option provides little in terms of security and environmental safeguards over indefinite above ground storage.

Deep disposal and phased deep disposal

These option(s) have clearly received support for placing them on the short list as they are the options with the most research behind them - because this is the option the nuclear industry proposed even before it had fully studied the issue. As the 1997 public inquiry into the Rock Characterisation Laboratory near Sellafield revealed, making a decision and then getting the science to 'fit' is not always a formula for success.

Greenpeace is of the opinion that the distinction between deep disposal and phased deep disposal as separate options implies making decisions about the future which it is not necessary to make now, and thus confuses the issue.

Costs alone make these options extremely difficult to justify at present, particularly given the uncertainties over the suitability of any site; the ability to monitor and retrieve wastes; uncertainties over the amount of wastes that would go to the site and lack of firm knowledge over the integrity of conditioning for the more long lived wastes.

Recommendation: Greenpeace does not believe that deep or phased deep disposal is an option at present – and indeed may never be. Rushing into this (and recommending this would be rushing given the number of outstanding problems for this option) would foreclose on many other options being given serious consideration.

Other 'options'

Greenpeace notes that CoRWM originally proposed:

- Partitioning and Transmutation;
- Burning in reactors;
- Incineration; and/or
- and Melting of Metals

These are mainly 'options' which deal only with some types of radioactive wastes in the inventory. If implemented some might be able to be carried out in conjunction with another option, but others should be discarded immediately.

- **Partitioning and Transmutation**

This should be discarded now as an unproven option which, even if it did eventually become workable, would require a commitment to both nuclear power and reprocessing – both of which are environmentally unacceptable and fail all the principles that Greenpeace supports; as well as failing many of the criteria CoRWM has laid out.

Although research is continuing on reactors which can ‘transmute’ plutonium, there are still major outstanding problems. With regard to this the US Energy Secretary, Abraham Spencer has noted “Nuclear energy technology has the potential to improve the quality of life for people around the world if we are successful in solving issues such as economics, waste and proliferation.”⁵² To overcome these problems would be no small task – and is hardly likely to happen for quite some time. Given the scale of the problems the challenges the industry has to overcome in order to exploit partitioning and transmutation of waste it is doubtful CoRWM will want to wait to explore this option further.

- **Burning in reactors,**

This option – mainly for uranium and plutonium – is rejected on the same grounds as those given for partitioning and transmutation. It fails on a number of CoRWM’s criteria and certainly does not meet the principles Greenpeace has submitted.

As noted in the summary of this response, Greenpeace opposes any options for waste management or ‘disposal’ which encourage activities which lead to the creation of more nuclear waste. In particular this includes ‘burning’ plutonium and uranium in reactors.

As CoRWM knows from reports it has commissioned, this option could not be employed (well, certainly not at a realistic cost) in existing reactors in the UK. As it is highly unlikely the UK’s plutonium stockpile would be used overseas, it could then only be ‘burnt’ in new reactors in the UK. It is widely known that new build is a highly controversial subject and is certainly not guaranteed. If the Committee recommended this option it would, inter alia, be recommending new build – hardly a sensible action for an organisation which is asking the public to tackle the current nuclear waste problem.

Apart from the very real issues of risks, terrorism, costs and other major social, political and ethical dilemmas posed by the burning in reactors option, there is also the fact that this option doesn’t make the plutonium or uranium disappear. Burning these materials either changes them into other radioactive materials or incorporates them into spent nuclear fuel – a substance which is extremely hazardous, indeed far more dangerous than the original plutonium and uranium used to make the fuel.

There are also wider implications for the use of plutonium and uranium in reactors. As CoRWM is aware the Competition Commission of the EU is currently undertaking a state aid investigation of the Nuclear Decommissioning Authority and BNFL because of a range of potential subsidy issues. It is reasonable to assume that the use of subsidised plutonium and/or uranium – created from subsidised reprocessing operations – would also raise state aid issues. If the NDA proposes to rid itself of plutonium by advocating the use of it in

⁵² *France gives USA access to Next Generation Nuclear Technology*, ENS, 25 August 2004
http://home.earthlink.net/~cevent/8-25-04_france_shares_next_gen_nuc_tech.html

reactors, then this would be a state aid subsidised act. In terms of meeting Euratom commitments (taking a relatively non-radioactive substance and making into a very radioactive one) it is highly unlikely it would meet any of Euratom's criteria either.

In respect of all waste management options Greenpeace also refers CoRWM to the UK's 'National Report on Compliance with the Obligations of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management:

http://www.defra.gov.uk/environment/radioactivity/internat/pdf/ukreport_pt1.pdf (particularly waste minimisation and sustainable development principles and policies referred to in the document

(see also IAEA's Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management – which we understand CoRWM is getting expert opinion on

<http://www.iaea.org/Publications/Documents/Infocircs/1997/infocirc546.pdf>)

- **Melting of metals**

Greenpeace is not opposed to this option per se as a means of reusing materials from the nuclear industry. However, this is certainly not an 'option' for all nuclear waste – but a sub-option for some types of waste. Any proposal to employ this method would have to meet the environmental principles which Greenpeace has published.

- **Incineration**

As with melting of metals, this option would have to meet Greenpeace's environmental principles. Discharges to the environment alone from this option would probably rule it out. There would also be significant concerns about what would happen to the waste products from incineration because, as with so many other parts of the nuclear fuel cycle, this process does not get rid of the radioactivity it simply changes the form of the material.

Brief notes on the inventory:

- The inventory should reflect the amount of radioactivity which will result from various options, as well as the volume of waste. For example, it is crucial people understand how much more radioactivity will be created through burning plutonium and uranium in reactors than if this material is treated as waste.
- CORWM should try to put the relative amounts of radioactivity in different materials in context e.g. HLW in general contains X amount of radioactivity per square metre, spent fuel from conventional reactors contains Y amount of radioactivity per square metre – and so on for MOX spent fuel, intermediate level waste and low level waste.
- The main radioisotopes – and the half-lives – should be given for different types of wastes;
- The inventory should also contain information on projections of waste from potential reprocessing contracts e.g. if BNFL/NDA secure new contracts X amount of LLW will result and Y amount of ILW from reprocessing overseas fuel – and similar for LLW,

ILW and HLW from reprocessing spent fuel in the UK.