



Greenpeace Submission to the Proposed Regulatory Justification decisions on new nuclear power stations: Consultation Document

February 2010

Note:

In replying Greenpeace references three consultations documents: the main consultation document, the consultation document on Westinghouse's AP1000 reactor (which is virtually identical to the document on the EPR) and the technical advice from IDM / National Nuclear Laboratory (NNL).^{} For the sake of avoiding repetition where necessary we refer to the relevant part of Greenpeace's response to the Justification consultation.¹ We note the consultation questions in the main document and refer to them as they are answered, though not in order of how they have been presented written in the consultation document.*

Summary

- The Consultation Documents do not answer the majority of the questions put to government by Greenpeace and others in the 2009 consultation on the Nuclear Industry Association's (NIA) application of 2008.²
- No evidence proving that new nuclear can be justified, including *all* aspects of the *new* practices (from uranium mining, reactor operations through to new waste creation and final disposal) or that any supposed benefits outweigh the health detriments has been provided in this consultation.
- The consultation documents do not adequately cover the full scope of the practices applied, or those that might be applied. They lack essential information on health detriments from all potential routine operations associated with the new practices, whilst essential information on the possible radiation exposures and resulting health detriments from accidents or terrorist attacks continues to be omitted (as with the initial NIA application). Additionally there is wholly inadequate information on the possible variations of spent fuel management (on-site storage, conditioning, encapsulation and / or reprocessing and disposal).
- In the absence of a quantification of the health detriments and potential safety and security risks, the consultation documents lack any information on the weight that the Secretary of State is attaching to these considerations. There is no balancing being done between the benefits and these risks, and as such the proposed decision does not fulfill the UK's obligation to "ensure that all new classes or types of practice resulting in exposure to ionizing radiation are justified in advance of being first adopted or first approved by their economic, social or other benefits in relation to the health detriment they may cause." (Article 6 Directive 96/29 EURATOM)
- It remains our view that the NIA was not the appropriate entity to have made the application.
- No explanation is given, or review period proposed, for how changes or developments in the practices may be addressed in the future. Does the government think it can justify all stages of new practices now? If not, if major changes to those practices or stages of them are proposed, how will they be dealt with - through other processes or under separate justification applications?
- No explanation is given as to how possibly major changes, particularly regarding the back end of the nuclear fuel cycle, proposed by vendors, utilities or the Nuclear Decommissioning Authority (when it takes title and liability of spent fuel) will be handled.
- The draft Justification decision and supporting documents are fragmented and in no way adequately inform the public or concerned stakeholders about the full impacts of new nuclear power - particularly

^{*} Though NNL was formerly owned by BNFL the technical support document does not mention that the IDM contributors are both former senior managers at BNFL, which formerly owned Westinghouse (see <http://www.idmsolutions.co.uk/content.php?pageID=7> and <http://www.idmsolutions.co.uk/content.php?pageID=8>). This immediately raises serious questions of potential bias and conflict of interest over what is supposedly independent advice.

regarding health detriments.

- The documents have been so poorly presented that ease of reference is nigh on impossible. One of the most relevant, the Secretary of State's *New Nuclear Power Station Designs: Determinations on Class or Type of Practice* was not even on the main consultation website, but secreted away somewhere else entirely.³
- This, coupled with the fact that the consultation assumes people have time to access the internet, can download, print and were able to read the documents undermines the consultation still further.
- Vendors and some utilities have already indicated they are interested in developing other options (e.g. for spent fuel management) that differ from those set out in the White Papers and other consultation documents. The whole of the new practices, and variations on them, should have been covered by the initial application so that all possible scenarios could have been considered.
- There is little explanation of how, and when, Justification links to other processes and decision making on the new practices. There is no explanation of how a decision on Justification may impact on, for example, waste disposal and the Managing Radioactive Waste Safely (MRWS) processes.
- It is entirely inappropriate that the Justifying Authority for this decision is the Secretary of State. Justification is a regulatory function and as such must be carried out by an unbiased decision maker, not someone who has repeatedly gone on record as urging the development of new nuclear.
- It is not clear why government has decided to undertake this consultation at the same time as the consultation on the Energy National Policy Statements (in particular the Nuclear NPS).
- It is neither fair nor reasonable to ask people to comment on the thousands of pages in the Nuclear National Policy Statement and the third stage Generic Design Assessment reports, and at the same time expect them to be able to respond properly to the very lengthy draft Justification decision (and other relevant documents e.g. all the responses to the first Justification consultation). The public, interested stakeholders and local authorities will have had little chance to properly consider this weighty consultation. An inquiry would provide some remedy for this.
- The Secretary of State must hold an inquiry into the draft Justification decision *after* the consultation process closes but *before* he makes a final decision. This process must be opened up to an unbiased and independent public examination. It is essential that the many issues not properly explored in the application are examined at an inquiry, as allowed for under the regulations governing Justification.
- An inquiry is essential because there has not been open scrutiny of the draft Justification decision. The draft Nuclear National Policy Statement is being examined by the Energy and Climate Change Committee, yet any decision made following consultation on the draft Justification decision will not be subject to Parliamentary scrutiny.
- An inquiry would improve the quality of decision making by allowing for cross examination of evidence on the potential health impacts of routine operations, accidents or terrorist attacks on reactors, spent fuel stores and examine waste disposal.
- Only one meeting on this has been held on the draft Justification decision over the whole consultation period. Local communities - those most at risk of health impacts - have not had the same opportunities to discuss this matter as they have with the draft Nuclear National Policy Statement.
- The Department of Energy and Climate Change (DECC) chose not to discuss Justification at any of the local events it held around the Nuclear NPS consultation.
- The Nuclear NPS (4.1.212) states that the "IPC should not consider whether or not the aims of the (EU) directive (on Justification) have been or will be implemented."
- This decision forecloses any further discussion of the potential health detriments of new build. Yet many local authorities - who will have to oversee emergency planning in the event of an accident at a nuclear plant - are also unaware or unable to respond to the draft Justification decision because of

the scale of work required for the six energy related national policy statements.

- The land sale agreement between EDF and the Government over the formers purchase of British Energy pre-empts this Justification decision by stating that certain activities will not take place until EDF gets planning permission for EPRs.

Q.1 Radiological Health Detriment and practice as a whole

Before commenting on radiological health detriment is it important to consider the new practice(s) as a whole. Without an understanding of the practice as a whole (the facilities involved, its scope in terms of size and the time over which it will have a radiological impact) it is not possible to make any realistic assessment of the possible operations and resulting doses and therefore health detriments. The consultation documents fail to provide this.

Practice and scope / extent of practice

Greenpeace notes that the consultation documents state that the practices are considered "new" but do not adequately explain the full scope of the practice e.g. the facilities associated with reactors (proposed interim spent fuel stores on-site, encapsulation plants, geological disposal facility). A clear overview of what each of the new practices would entail, including all essential and associated facilities, should have been presented. That they have not indicates that some of these technologies (e.g. encapsulation and disposal) are totally untried in this country.

No detail is given of precisely where encapsulation will take place, which is relevant not only to new build / siting issues (itself directly related to populations which might be exposed), but also to the outstanding issue of the possible reprocessing of spent fuel. This has not yet been ruled out by government, but no operator has yet come forward with a proposal. This error is probably because it is impossible for DECC, vendors or utilities to actually give details of *all* the possible health detriments of *all* stages of a practice - for key practices and technologies are totally unproven in the UK e.g. spent fuel encapsulation and disposal.

These unknowns (e.g. disposal) will not take place at new build sites but at places where the NIA's members have no control. Such waste facilities have not yet been designed, so it is hardly surprising that key information about the whole package is missing. Yet without this information the government cannot reasonably or rationally justify the whole practice of new nuclear.

In terms of a definition of a reactor, the NII states:

The "proposed design" includes the reactor, supporting services and buildings, the turbine island, and the radioactive waste and spent fuel facilities necessary for the proposed lifetime of the power station.⁴

Although this seems comprehensive, that information on exactly where, when and how some stages of the practice might take place (e.g. spent fuel conditioning or encapsulation) is entirely absent again prevents anyone making an accurate prediction of the potential radiation doses and detriments with any certainty. Yet the consultation documents give the impression that all of these matters are settled.

We note further, in relation to siting of nuclear facilities relevant to the practice, that the IPC (Nuclear NPS 4.8.12) states, in connection with the outcome of any Justification decision, that: *it should not consider whether or not the aims of the directive have been or will be implemented.* This means facilities that might give rise to any radiation doses / health detriments will not be considered by the planning body charged with looking into siting. Indeed, health detriments will not be considered by the IPC at all.

It is not made absolutely clear if any decision that results from this consultation will cover disposal of wastes from new build. If so, this should be an extended and expanded definition of the practice being covered and a process to take into account the impact of this on the MRWS. The consultation documents do not this.

Central storage and / or encapsulation

The issue of central storage for spent fuel has also not been ruled out. The whys and wherefores of central storage and where encapsulation might take place (e.g. not at reactor sites) is not fully explored in the consultation. The idea of a central store for spent fuel or a central encapsulation plant (possibly at the head of a yet to be decided on repository site) and / or reprocessing are all major issues that have not been even adequately discussed in this consultation. In fact, on spent fuel storage in general, and encapsulation in particular, the consultation virtually ignore the issues.

Encapsulation has similarly been disregarded, not just because of the ongoing behind-the-scenes row over on-site versus central plant location, but also because the industry does not even have criteria for how to encapsulate spent fuel in the first place. The application should have discussed each step of each of the new practices that might give rise to doses, will incur costs and involve facilities that could result in major releases if there were accidents or attacks. It is quite incredible that this consultation has not bothered to do so.

We take issue in particular with the following statement (AP100 document 4.133):

Experience in the UK and overseas shows that spent fuel can be, and is currently, transported safely and securely. In respect of external dose rate, the Secretary of State notes that the encapsulation, transport and emplacement of high burn-up spent fuel can be shown to be feasible using existing technology. (our emphasis)

This is deliberate and deeply misleading sophistry that cannot stand unchallenged. Neither the encapsulation nor final emplacement of spent fuel has been undertaken in this country and cannot be 'shown' to be feasible. Indeed, even Areva has noted that "No spent fuel direct disposal facility is currently available in the world."⁶

Reprocessing

The AP1000 consultation document notes (4.29):

The White Paper on Nuclear Power explained that in the absence of any proposals from industry, the Government has concluded that any new nuclear power stations that might be built in the UK should proceed on the basis that spent fuel will not be reprocessed and that plans for, and financing of, waste management should also proceed on this basis.120 The Secretary of State has therefore not considered high level waste (HLW) which arises from fuel reprocessing in this proposed decision document.⁶

The first line, if an honest appraisal was made, should have read 'in the absence of any proposals *at present* from industry,' because the issue of reprocessing has not been totally ruled out by them. Indeed, given that spent fuel is owned by the companies that will operate the reactors, government can make no definitive statements on this one way or the other. Reprocessing could well become an issue in the future and should reasonably be considered now as a possible part of the practice as a whole. As with the original application this matter should have been fully explored - not only because of the potential health detriments but also because of the impacts on waste management and disposal.

MOX

The possible use of mixed oxide (MOX) fuel is not discussed, yet in the application both the AP1000 and EPR are said to be able to use MOX fuel⁷. If vendors, operators, or even the NDA, intend to use MOX fuel sometime in the future this should be covered in the application. We note in its January 2009 document the NDA raised this as a possibility (para 5.4.1.⁸) and it listed as an option for the UK's plutonium stockpile the following:

Fabricate MOX, utilise it in UK state owned reactors and sell the resulting electricity.

Disposal

On spent fuel disposal the consultation does not fully discuss the range of possible impacts of new build spent fuel disposal in a repository with legacy wastes. It does however assume disposal of new build with legacy wastes, despite the fact there is no site yet chosen for a geological disposal facility (GDF) and no community which has said it will accept all legacy waste and all new build wastes.

It does not discuss the issue of a second repository that might be needed for spent fuel and other wastes from new build, either for technical reasons or because of the size of the programme. The possibility of finding a second repository would be a major issue as the process of finding a first repository is still in its infancy. There is the assumption that disposal will eventually take place. There is no Plan B. This has been flagged in government documents⁹ and could clearly have a major impact on costs - which in turn may impact on how much new build comes on line (and what it does or doesn't contribute to other energy targets) and security of supply.

In addition we note:

- As the size of the new build programme is unknown, the application should have included details

of what might be needed if a new build programme goes above a certain size) e.g. over 10, 20 or 30 new reactors) and the impacts on health detriments, waste management and disposal, especially as the government refuses to set an upper limit for potential new nuclear capacity.

- Conditioning, encapsulation and disposal methods for spent fuel cannot be determined until a site for a GDF is found. Until, and if, these issues are dealt with the spent fuel - which accounts for the majority of the radioactive inventory arising from the new practices overall - will be left unresolved.
- This leaves key issues that should be known and discussed under Justification to be dealt with through later, unspecified, processes.
- Plans and timescales during which decommissioning might take place remain similarly opaque.

On the possible changes and different approaches we refer to the evidence Greenpeace gave to the Energy and Climate Change Committee.¹⁰ This is an updated version of the list of possible scenarios given in our 2009 submission (page 18).

Health - radiation doses and detriments

The consultation does not meet the requirements as set out in the guidance issued on Justification (BERR 2008) as it does not quantify the possible detriments of new practices e.g. the impact of a major accident and release of radioactivity at a spent fuel store.¹¹

No information is given as to who will act to ensure not only that legal limits and constraints in radiation doses are met, but also how Basic Safety Objectives (BSO) - that are to be met or achieved - as per the Nuclear Installations Inspectorate's (NII) Safety Assessment Principles (SAPS 573, 589).¹²

See also our 2009 submission (page 5-6) for a discussion on this.

This is important because there is a significant difference in the Basic Safety Limit (1mSv - the legal maximum exposure) and the NII's BSO 0.02mSv. In addition, there are the different constraints to consider: 0.5mSv per site or 0.3mSv per source (CD IDM p 4) - or the 0.15mSv per site (reactor and waste facilities) as per the HPA's July 2009 statement on this. How the HPA constraint of 0.15mSv would be applied either to new build along with possible existing operations (operational reactors, waste storage or decommissioning) and with new reactors and spent fuel stores etc is not clearly explained in the consultation.

In relation to the above, we also note the following statement which appeared on the Justification consultation website in early February - some twelve weeks after the consultation started:¹³

Proposed 0.15 mSv dose constraint: The Nuclear Industry Association (the Applicant) has confirmed that the statement in Annex E of volumes 2 and 3 of the consultation, referred to in paragraph 3.62 of Volume 2 and paragraph 3.58 of Volume 3, that "We confirm that designs within the proposed practice (and also their associated waste management and disposal facilities) would be capable of meeting such a dose constraint for members of the public set at 0.15 mSv per year" means that the proposed power stations including spent fuel interim storage facilities and waste conditioning and encapsulation plants would be capable of meeting a 0.15mSv/y dose constraint.

It is not known how the NIA, or any other organisation, is able to say with certainty that it knows exactly what doses (either collectively or separately) will arise from all parts of the practice (particularly for untested processes such as encapsulation and disposal) over all time. It is also not clear how disposal of wastes fits, or not, under the 0.15mSv constraint which would take place at a separate site. We note that the Secretary of State accepts the applicants' assurance that the practices will meet legal dose limits, but there is no suggestion that this assurance has been subject to any review for reliability or attainability, or quantification of what exactly the dose exposure is likely to be.

The consultation documents do fully detail what 'interim' storage of spent fuel means (or could mean, given the different options possible), nor does it explain encapsulation and how this process will be undertaken. They should have provided a full description of all essential on-site facilities, with the expected discharge levels; the doses they might give rise to and the total radioactive inventory they might contain. They give different figures for potential doses, but no attempt is made to place a health detriment on them e.g. the number of cancers, non-fatal cancers etc which are expected to arise from the new practices as a whole - from uranium mining through to final waste disposal (and in particular from reactor operations, spent fuel storage, encapsulation and disposal).

Assessment of collective doses and the potential impact of them in terms of estimates of the number of cancers - over time and across populations – is not included. These should have been included regardless of the ICRP's view, because Justification is about weighing up potential detriments against potential benefits, and Article 1 Directive 96/29 EURATOM expressly defines 'health detriment' as including cancer risks. The consultation does not allow the reader to do this. We note COMARE will not report on its review of the Kikk study until after the consultation closes.

Overseas practices

The consultation seeks to allow the UK government to wash its hands of the impact of overseas practices - which it is claimed result in the majority of detriment from a new build programme (IDM, p 4):¹⁴

Several respondents to the consultation commented that the assessment of the benefits and detriments of a Class or Type of Practice definition should reflect the full extent of the fuel cycle, with particular reference to the mining and milling of uranium. Although the authors understand that the approach taken by the Government is that a Regulatory Justification decision takes account only of activities in the UK, this technical advice reviewed the radiological consequences of the entire fuel cycle for nuclear power generation using current reactor designs, and illustrated that the dose and detriment from the operation of a nuclear reactor is a relatively small part of the overall detriment - around 4% in the example used. Whilst over 90% of the radiological detriment is associated with uranium mining and milling, the major uranium suppliers to the UK, for example Australia and Canada, have very similar regulatory regimes to the UK, and apply the same radiological protection principles and dose limits.

Points raised in our 2009 submission on fuel enrichment, conversion and fabrication, and where it is undertaken and where the possible detriments and benefits may fall, are not answered. We also note that the possibility of using uranium from reprocessing has not been ruled out, yet the detriments of this are not covered.

Q.2 Radioactive Waste

The Determination document does not explicitly state that disposal will be covered in full by this Justification process. Yet the AP1000 document (para 4.1) notes:

ICRP Publication 77 states that "Waste management and disposal operations are an integral part of the practice generating the waste. It is wrong to regard them as a free standing practice that needs its own justification."

Yet the MRWS programme, and the staged permitting process being proposed by the regulators for a GDF, are proceeding under the understanding that disposal will be dealt with under a separate, legal process not yet fully determined. This raises an important point for those considering disposal: is this decision pre-emptive? Has it been fully discussed with the relevant parties? If Justification of new reactors also justifies 'disposal' this should have been clearly spelt out in the consultation, particularly if it overrides any element of 'voluntarism' or the regulatory processes.

The documentation should explain how any Justification decisions will impact on the frameworks being discussed in other processes the Government will undertake soon (e.g. discussions on the Funded Decommissioning Programme and Fixed Unit Price for waste disposal).¹⁵

Although the CD now acknowledges key elements of the new practices (e.g. possible 160 years on-site storage of spent fuel) it does not fully discuss a central store for spent fuel, a central facility for encapsulation or whether these would come under any decision made following this consultation. We note Westinghouse has written to the Nuclear Installations Inspectorate expressing concern over Government plans for the time period of spent fuel storage and that this might impact on disposal.¹⁶

Wastes - ethics and process for new build wastes:

On this we refer not only to the documents referenced in our 2009 submission but also to a letter to the Secretary of State from four former members of CoRWM 1 in November 2009 on this issue.¹⁷ CoRWM 1's concerns about how to assess the impact - including the ethics of processes around new build waste - are reiterated in a recent statement from CoRWM 2.¹⁸

We note the original application misrepresented what CoRWM said on this matter (Greenpeace 2009

submission, p 13).

In general the consultation looks at the implications of spent fuel and ILW on a repository's size (and then seeks to minimise the impact), but fails to address what impact reprocessing of spent fuel might have - even though some of the applications supporting utilities have not totally excluded still believe this should be included as a possibility under the new practices.

Q.4 Safety and Security and Q 7 Economic Assessment

On radiological emergencies but not terrorism

Stage 4 of the non-legally binding Generic Design Assessment (GDA) process will not be finished until June 2011 at the earliest. It will then be followed by licensing. The assumption that the risk of accident (to reactors and associated facilities) is low and therefore acceptable is pre-emptive.

We note in the AP1000 consultation document (6.9) that:

The Application states that the potential vulnerability of nuclear power stations to terrorist or other malicious threat is further reduced by the fact that they are amongst the most robust civil structures in the world, and have a multi-layered defence.

How does this accord with the Regulatory Instrument raised by the NII with Westinghouse on the shielding for its AP1000 reactor?^{19, 20} Westinghouse is not expected to reply on this until October 2010, well after the Justification decision has been made. Statements that reactors are robust are no more than optimistic claims at present and should not be presented as fact, as they are. This further underlines the pre-emptive nature of the Justification consultation.

The consultation documents do not inform readers that if there were an accident then the permitted exposures which might be allowed could be between 20mSv and 100 mSv.²¹ The actual doses received following an accident or terrorist attack could be much higher (the doses referred to assume a degree of control over an accident situation that many would be quite rightly very sceptical of).

The CD does not mention that to avoid very large doses after an accident people may have to be evacuated from their homes or that counter measures may need to be in place for decades.²²

The possible health detriment of an accident is not given and the impact of accidents cannot be addressed simply by pointing to regulations and governance arrangements for the industry (e.g. the AP1000 document 6.18). The consultation seeks to avoid discussion of terrorist actions and possible doses from an attack, for example, on a spent fuel store and thus ignores another potential health detriment. The consultation should have addressed the issue of new reactors, spent fuel stores and encapsulation plants in the context of what the proposals are for the new practices as a whole over 60 years of reactor operations and a possible 160 years of spent fuel storage. These are timescales over which institutional control cannot be guaranteed.

The consultation fails to quantify the safety and security risks of the new practice. Although treated as a separate area of risk in the consultation, safety and security issues cut through every part of it. The government's draft decision in terms of the risks to health and environment, and risks from waste, are all contingent upon the existing regulatory scheme being sufficient to prevent accidents (see, for example, the AP1000 document 3.106 and 5.56).

The Secretary of State notes (AP1000 document 6.18 and 10.30) that he has consulted the regulators and advisors "on the measures in place to prevent accidents and protect against security threats such as terrorist attack" and "agrees with the views set out in the White Paper on Nuclear Power that the risk of an accident can be managed through arrangements for design and regulatory and corporate governance for the nuclear industry." On this basis, no proposed nuclear practice will ever fail to be justified on grounds of safety or security concerns. Even though the HSE has expressed "significant concerns" in its 3rd Stage GDA reports and would not currently pass either of the proposed practices for construction based on present submissions, the government believes them to be justified because the GDA process itself is in place.

In addition, there is no quantification of the actual risk from this practice, and therefore no consideration of what the health detriment would be if that risk were to materialise. Instead the government concludes that the current regulatory regime can manage the risks, which misses the point entirely. If the existing regulatory regime could not manage the risks – if, for instance, an application were received for a reactor that had no containment system – there would be no question of it being justified. But that cannot mean that if an

application is within the regime then there need not be a full examination and consideration of its relative safety. The Secretary of State should have considered what the actual risk of accidents and security threat from the practice is (i.e. what is the probability of an accident and what the existing regulatory regime does to mitigate it) and then what damage would be caused were that risk to eventuate (i.e. the health and environmental detriment), taking into account any measures that are in place to ameliorate such damage. Compare this to the government's approach to waste disposal in the AP1000 document (4.10).

A quantification of the damage, multiplied by the probability of it occurring, would give a meaningful input into the balancing exercise. It may be that the quantification would be speculative, and hard to achieve, but it can still be of use. And unlike the government's approach, this could clearly reflect the fact that some practices present a higher risk because the probability of an accident occurring is higher, or that they would cause far more extensive damage in the event of an accident happening. It appears that a perfectly good starting point would be available under the GDA being conducted by the applicants themselves in the form of their (still incomplete) probabilistic safety analyses.

The statements in the consultation on the issue of safety itself are somewhat surprising. The point repeatedly stressed is that, *"there are at this stage no safety or security shortfalls that would be so serious as to rule out its eventual construction on UK licensed sites."* We expect the Government to give due weight, in looking at Justification, and to fully consider *and* reflect the findings of the HSE's 3rd stage GDA reports.

The consultation does not answer the points raised in our 2009 submission (pg. 9-11) where we noted that the original application ignored substantial pieces of independent research into the potential for terrorist attacks on nuclear installations. This consultation does the same.

Insurance / liability regime

The consultation does not make any substantial response on the economic impact of a potential accident or terrorist attack. The potential disadvantage to the UK as a whole, from a major accident or terrorist attack, is meant to be covered by a new financial liability regime. Changes to the UK law, brought about by changes to the international liability regimes (with a much expanded remit) were meant to be consulted in mid-2009 but consultation on this has now been delayed until mid-2010 - the reasons for this delay are not explained. We refer to our 2009 submission (pg. 11- 12) and note that insurance for liability is to cover all parts of a practice.²³ The documents fail to explain what is covered now, and what is expected to be covered. It makes no mention of the problems envisaged with the possible uninsurability of certain impacts of an accident (and terrorist attacks) under the new regime.²⁴ Nor that the nuclear industry has expressed concerns over how it will cover liability in the event of an accident, and has lobbied government on this.^{25, 26}

Since the NIA's 2008 application it has become known that commercial cover will not be available for all the nuclear industry's liability under the new regime and that, in addition to the existing 'last resort' of the taxpayer (to pay for any shortfall in what needs to be covered following an accident) the government is now considering having to provide an insurance scheme to cover areas commercial companies will not cover.²⁷ What this could mean in terms of subsidy to the industry - that the Government will cover aspects the commercial insurance industry will not cover - is not quantified.

The consultation remains as dismissive of potential economic impact²⁸ as the original application (NIA 2, para 7.29).

That the consultation on the new liability regime, and the changes to UK law to accommodate it, is due to start in the middle of 2010 is another example of how premature the Justification process is, in terms of Parliamentary and public processes. That government has failed - yet again - to find the time and resources to consult on this prior to this second Justification consultation is indicative of confused nature of this process.

As noted in our 2009 response (pg 11) it is one thing for the industry and government to argue the risk of major accident is low, it is quite another for it to completely ignore what the possible costs might be if there is one. This issue is dealt with in a few brief paragraphs and it appears the government has totally accepted the industry's claims on this matter (see the AP1000 document, paras 9-35-9-40).

It is unacceptable for the industry to be allowed to simply claim (as in its application) that because it believes the risk of accident is low then *"the deployment of the practice is not expected to impose an economic detriment on the wider UK economy associated with the risk of a severe accident,"* then this matter can effectively be ignored. The consultation had the opportunity to remedy this by fully examining the possible economic impact of an accident (and terrorist attack) and use worst case scenarios, but does not do so.

Terrorism is also effectively dismissed as an issue and reliance is placed on the regulations in place to cover security. We note on that a senior DECC official has conceded that in terms of information on security (page 41):²⁹

Indeed, we on this panel are probably not privy to most of the more sensitive information, and understandably so in terms of basis of threat, but on the basis of what they understand about the regulatory process and the designs, they have given us a clear assessment on what they think is appropriate.

If hard information is being withheld by officials overseeing the consultation it is perhaps no wonder the public is also being starved of real information on these matters.

Proliferation is also dismissed as an issue (see our 2009 submission, page 12)

Transport

Again, concerns around transport are minimised. It is known that new build will create spent fuel much hotter and more radioactive than that produced from existing and decommissioned reactors. The assessment points to the fact the transport of spent fuel currently takes place and implies that because it is already happening, it is (by inference) acceptable to continue this practice for the next 160 years. The consultation assumes that full control of safety and security will continue over this time period. This is patently absurd and overly optimistic.

We also note the original in the application (NIA 2, 4.62- 4.67) does not give any indication as to how the transport containers would resist an attack (e.g. a grenade launcher, a large amount of explosive). It looks only at accidents.

The issue of when the Government takes title and liability of the spent fuel remains a key question, not only for storage options, but because of encapsulation *and* reprocessing. The possibility of a central encapsulation facility was established by the NDA could mean the Government taking title to, and liability for, the fuel at an earlier stage in the management process (i.e. before encapsulation). This could also change funding systems and may increase the risk of additional subsidy to the industry. This is another example of a potential economic disadvantage which could well arise as a result of the new practices.

Q. 5 Carbon Reduction Benefit / Q.6 Security of Supply Benefit

A senior DECC official claimed that:²⁹

“Regulatory Justification is a high level, generic process confined to the class or type of practice under consideration. It applies wherever in the UK the practice is adopted. It is separate and distinct from licensing and optimisation, which would take place at a later stage in the event of a power station being built at specific sites. It is not a comparison of advantages of different methods of generation.” (emphasis added)

The consultation fails to fully quantify the detriments of nuclear power and in highlighting the benefits relies heavily on the disadvantages of fossil fuel use to seek to justify new build. Yet it does not open up for examination the detriments and advantages of nuclear power versus those of renewable energy or efficiency measures.

The benefits of nuclear power (e.g. security of supply) presumes *all* the necessary decision making processes, planning permission and licensing run smoothly and to time. Given there are still major question marks over the designs themselves and also that the IPC may not approve every application, or that the industry may not invest to the level assumed (even 10GW) within the timeframe assumed then the benefits are not a 'given.'

On both these questions we refer you to the Greenpeace and Friends of the Earth evidence provided to the Commons Energy and Climate Change Committee sessions looking at the Energy NPSs.^{30, 31}

Q.8 Secretary of State's Proposed Decision

There is no cut-off date as to when justification allowed in 2009, as envisaged in the Government's timeline, might expire. Is this application for all possible stages of the proposed new practices for all time? From the

initial NIA application through to today there are so many unknowns in terms of reactor licensing, operations and spent fuel management (let alone waste disposal) for a full informed and reasonable decision to be made now. For Justification to be decided upon before the GDA process in particular makes clear that the processes are fragmented and ill-ordered. As the Environmental Law Foundation has noted, Justification is too important to be decided through written responses to consultation documents.³² It is contrary to any good practice that the major issues of substance around Justification are left to closed door discussions of officials. This whole process and the issues it considers must be opened to public scrutiny and challenge.

As noted at the beginning of this submission, for many reasons, including the need for full and transparent scrutiny, the testing of the evidence and public participation in this vital process, that the Government should hold an inquiry, as allowed under the *The Justification of Practices Involving Ionising Radiation Regulations 2004 (No. 1769), Regulation 17*. This should be after the consultation but before a decision is made.

It is our views that the draft decision shows that the Secretary of State has misconstrued his obligations under Article 6 (1) of Directive 92 / 29 / EURATOM and has failed to properly conduct the balancing exercise that this obligation requires. The Directive clearly states that the process of justification be based on a balancing exercise – a practice has to be assessed “by its economic, social or other benefits in relation to the health detriment it may cause.” This entails weighing the economic and social benefits against health detriment on the other, and deciding which factors weigh more heavily to determine where a practice is justified. To carry out a meaningful balancing exercise, weight has to be attached to each of the factors being balanced so they can be assessed against each other. We note that the Secretary of State has previously considered that balancing to require a full cost-benefit analysis, in the sense of full financial quantification of a positive NPV outcome, when determining whether the manufacture of MOX fuel could be justified (see *R (Friends of the Earth and Greenpeace) v DEFRA* [2001] All ER (D) 222).

Without, at the very least, some basic level of quantification there can be no meaningful balancing exercise. This cannot be done in the abstract, just by considering the general effects of ionising radiation. Yet, the government fails to properly quantify the radiological health detriments and safety and security implications of the practices.

Radiological health detriment

Instead, in respect of health detriment, the government uses radiation dose limits as being synonymous with health detriment and concludes that it is “*more meaningful, and more effective in terms of mitigating the potential radiological detriment to health from new nuclear power stations, to base his decision on the system of dose limits*” (see AP1000 document 3.83). This concludes that dose exposure is a good measure of risk to individuals but that there is no reliable way of aggregating individual measure to analyse the risk to the broader population. As it is considered that there is no reliable way to measure cancer cases, the consultation simply does not bother to try – and in so doing fails to properly quantify the possible health detriment that may result from new nuclear.

Article 1 defines health detriment as:

“an estimate of the risk of reduction in length and quality of life occurring in a population following exposure to ionising radiations. This includes loss arising from somatic effects, cancer and severe genetic disorder.”

Article 1, read in conjunction with Article 6, indicates the way in which cancer risks should be considered:

1. What is the dose exposure arising from the practice “*following exposure*”?
2. What is the risk of a reduction in the length or quality of life “*in a population*” following that dose exposure?
3. Can that risk be justified by the economic and social benefits received?

The consultation fails to complete points one and two. Consequently point three cannot be carried out meaningfully. The Secretary of State has not even attempted to quantify what the dose is going to be. Instead operators’ assurances that they will be able to operate below the Health Protection Agency’s 0.15mSv limit are accepted without verification. Instead the government presumes that so long as the dose is below the legal limit of 1mSv this can be justified. It is noted in the AP1000 document (3.52) that “*the measures taken to limit exposure to radiation are based on legal, regulatory or advisory limits and constraints on the level of radiation to which people can be exposed. They are therefore part of the Optimisation or Limitation processes...rather than to the Regulatory Justification process.*” In other words, it is assumed that so long as exposure is within the legal limit it is not a matter for justification at all.

The document also notes (3.75) that “*this [1mSv limit] represents a level of risk of cancer which would not be detectable among normal background levels of cancer risk,*” suggesting that publishing a statistical model to estimate the number of per capita fatalities resulting from annual dose is not appropriate because “*the number of statistical fatalities calculated can appear significant,*” whereas “*the individual doses on which these estimates are based are overwhelmingly at levels which are well below the legal limits in force.*” This is entirely unacceptable because the likely exposure from the practice is not quantified. Instead we are given a bland statement that the applicant thinks it will be “capable” of being less than 0.15mSv. The result of the government’s approach is that any proposed practice, if it is conducted legally, will be justified irrespective of how few benefits it yields, because the actual level of exposure it will lead to is never considered.

The Secretary of State concludes, with regards to the risk to length and quality of life (see AP1000 document 3.83) that it would be neither meaningful nor effective to consider the aggregate number of cases of cancer and consider how they impact on the wider population, or especially exposed sections of the population. This singularly fails to determine the actual health detriment that may result from the increased dose exposure caused by the practice. The reason for this (see AP1000 document 3.82) is that modeling cancer risk caused by doses below the legal limit would be difficult, based on questionable assumptions and therefore not meaningful. But this is no reason for not carrying out the exercise. The indication that constructing a model requires assumptions that may lead to an exaggeration of results may be correct - however, the public has no way of knowing whether this is the case if results are not published. The government could get round this by adding appropriate caveats or by the Secretary of State adding less weight to the results that might otherwise have been the case. The Directive explicitly states that health detriment is to be considered “*in a population.*” This means some kind of aggregation of results is needed. To not conduct and publish the risk analysis fails to comply with the requirements of the Directive and fails to allow consultees the chance to fully respond to the consultation.

Even if the government believes that this method would generate misleading statistics for risks to the wider population, it seems odd not to consider (at the very least) those sections of the population most at risk of exposure – such as those living within a fixed radius of a potential new build site. Aggregation for this much more limited group of people would be easier to conduct and could not be anything other than “meaningful.”

The draft decision should have provided information on the possible health detriment (i.e. number of cancers etc) as the basis on which it would then make the assessment as explained in Article 6 (1). Such estimates should also be applied to possible accident scenarios (and malicious acts).

Waste management and disposal (the latter of which has potential implications for health impacts on populations for thousands of years) should have been included in the definition of the Practice in this case.³³ It is necessary that the practice being justified should be defined by the Secretary of State so as to make clear that it encompasses waste management (all stages) and disposal.

Safety and Security

Likewise, as indicated above, in respect of safety and security implications the Secretary of State has focused on the adequacy of the regulatory regime. No quantification of the risk of an accident occurring is given. No quantification of the damage and health risk that would follow an accident is given. No account is taken of the HSE’s GDA stage 3 reports. Again, the draft decision does not conduct the balancing exercise required by Article 6. And again, consultees cannot meaningfully respond, as there is no transparency of the weight which the Secretary of State has attached to any/all of these factors.

Impact on this consultation

Because the Secretary of State has focused on the adequacy of the UK’s regulatory regime and the role of the regulators, rather than the actual risks and benefits of the practices themselves, the public is being further deprived of the opportunity to fully comment on all aspects of the new practice. There is no consideration given to whether regulators considering individual parts of the practices will themselves run a full and proper consultation. After all, the HSE does not formally consult as part of the GDA process. If not, the government’s relinquishing of responsibility specific risks and benefits as part of justification, deprives the public of the chance to comment on these areas of the consultation. On this basis it appears unreasonable that justification should run before the GDA process has been completed. Additionally, there is a risk that regulators will give weight to applications before them if the practice has already been justified by the Secretary of State and the public.

Q.9 other points

The consultation bizarrely continues to follow an application by the NIA rather than the reactor vendors or those utilities that may construct and operate reactors.³⁴ In the case of the GDA reactor vendors made the applications. Under the Strategic Siting Assessment it is mainly the potential vendors and / or operating utilities that put forward nominations (see our 2009 submission pp 2-3). Additionally there is no adequate information available in this consultation as to how vendors / utilities are assessing the risk to spent fuel stores and encapsulation plants alongside those of reactors. Therefore the supposed benefits cannot be stated categorically and assessed against the disadvantages. This leaves a further question mark over who has responsibility for the information provided in the consultation, based on the application and therefore questions over the probity of the application and the government's acceptance of it remain.

Greenpeace UK

February 2010

¹ http://www.greenpeace.org.uk/files/pdfs/nuclear/Nuclear_Justification.pdf

² <http://decc.gov.uk/en/content/cms/consultations/open/nuclear/nuclear.aspx>

³ http://decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/nuclear/new/reg_just/reg_just.aspx

⁴ <http://www.hse.gov.uk/newreactors/reports/progress-report-jan-mar-09.pdf>

⁵ www.epr-reactor.co.uk/.../Solid%20Radioactive%20Waste%20Strategy%20Report.pdf

⁶ http://www.decc.gov.uk/en/content/cms/consultations/reg_just_cons/reg_just_cons.aspx - para 1.61 states that the “decision does not extend to the reprocessing of spent fuel from new nuclear power stations. The Government's position remains as set out in the White Paper on Nuclear Power. Any new nuclear power stations that might be built in the UK should proceed on the basis that spent fuel will not be reprocessed.”

⁷ See NIA 3, page 60 para 2.15 on AP100. For MOX, see NIA 3, para 2.4 page 79 on EPR and MOX fuel

⁸ <http://www.nda.gov.uk/documents/upload/NDA-Plutonium-Topic-Strategy-Credible-Options-Technical-Analysis-January-2009.pdf>

⁹ <http://www.berr.gov.uk/files/file44486.pdf> (pg 45). We also note the application appears to assume all LLW from a new build programme could be accommodated in the current facility at Drigg in Cumbria. This may not be the case.

¹⁰ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenergy/memo/nps/m1202.htm> (para 8.4)

¹¹ <http://www.berr.gov.uk/files/file45384.pdf> (para 1.25)

¹² <http://www.hse.gov.uk/nuclear/saps/saps2006.pdf>

¹³ http://www.decc.gov.uk/en/content/cms/consultations/reg_just_cons/reg_just_cons.aspx

¹⁴ http://www.decc.gov.uk/en/content/cms/consultations/reg_just_cons/reg_just_cons.aspx

¹⁵ [http://www.berr.gov.uk/energy/sources/nuclear/whitepaper/actions/waste-](http://www.berr.gov.uk/energy/sources/nuclear/whitepaper/actions/waste-decommissioning/page47722.html)

[decommissioning/page47722.html/sources/nuclear/whitepaper/actions/waste-decommissioning/page47722.html](http://www.berr.gov.uk/energy/sources/nuclear/whitepaper/actions/waste-decommissioning/page47722.html)

¹⁶ https://www.ukap1000application.com/PDFDocs/UN%20REG%20WEC%20000098%20DCP_JNE_000105%20Passive%20Pressurised%20Water/UN%20REG%20WEC%20000098%20DCP_JNE_000105%20Passive%20Pressurised%20Water.pdf

¹⁷ http://www.whitehaven-news.co.uk/news/experts_fire_shot_across_the_government_s_bow_1_641940?referrerPath=news

¹⁸ <http://www.corwm.org.uk/Pages/Plenary%20Meetings/Forms/DispForm.aspx?ID=1052>

¹⁹ <http://news.hse.gov.uk/2010/02/16/hse-raise-regulatory-issue-ri-against-westinghouses-ap1000-nuclear-reactor-design/?rss>

²⁰ <http://www.hse.gov.uk/newreactors/position-statement-westinghouse.pdf>

²¹ HPA's advice on the application of the ICRP's 2007 recommendations to the UK (Table 5.5.1)

²² EC drafting regulations to manage post-accident radiation protection. Nucleonics Week, Volume 48, Number 51, 20th December 2007

²³ <http://www.nuclear-risk.com/onlineBrochure.asp>

²⁴ <http://www.westminsterenergy.org/Upload/2006-2008-public-events/20080207/3.3%20Tetley.pdf>

and

<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmenvaud/584/584we56.htm>

²⁵ http://www.nce.co.uk/news/2008/01/insurance_nuclear_threat.html

²⁶ <http://www.building.co.uk/story.asp?storycode=3120025>

²⁷ http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article6826650.ece

²⁸ http://www.decc.gov.uk/en/content/cms/consultations/reg_just_cons/reg_just_cons.aspx AP100 doc 9.35-9.40

²⁹ Department of Energy and Climate Change Office for Nuclear Development New Nuclear: Regulatory Justification Public Engagement Event – London 19 January 2010

³⁰ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenergy/memo/nps/m1202.htm>

³¹ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenergy/memo/nps/m0702.htm>

³² <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenergy/memo/nps/uc4802.htm>

³³ http://decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/nuclear/new/reg_just/reg_just.aspx

³⁴ <http://www.niauk.org/news/latest-nuclear-news/public-consultation-on-justification-of-new-nuclear-power-stations-1318-95.html>