

# **SAFE ENERGY E-JOURNAL No.39**

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### **1.0 New Nuclear Reactors - Background**

1.1 In February 2003, after an extensive energy review, the Government published an Energy White Paper which concluded that nuclear power was currently uneconomic and there were important issues about nuclear waste to be resolved. It also said that before any decision to proceed with building new reactors, there would be the fullest public consultation.<sup>1</sup>

1.2 On 29<sup>th</sup> November 2005, Tony Blair announced a second review of energy policy, and on 23<sup>rd</sup> January 2006 a formal consultation process was launched with the publication of a consultation document.<sup>2</sup> The Government's report on this review, *The Energy Challenge*, was released on 11<sup>th</sup> July 2006.<sup>3</sup> This concluded that new reactors would make a significant contribution to meeting our energy policy goals, but it would be up to the private sector to finance them. The Government said it would address the barriers to new build, and sought public comment on the proposal to establish a policy framework which would include a "Statement of Need".<sup>4</sup>

1.3 On 5<sup>th</sup> October 2006 Greenpeace lodged papers at the Royal Courts of Justice in London, which argued the Government did not carry out the 'full public consultation' it had committed itself to before making a decision to back new reactors, and the recent energy review was, therefore, legally flawed.<sup>5</sup> The High Court granted permission in November for the case to be heard,<sup>6</sup> and then declared the consultation unlawful in February 2007.<sup>7</sup> Alistair Darling, the then Secretary of State for Trade and Industry, announced to Parliament on 22<sup>nd</sup> February that the Government would accept the High Court judgement and launch another consultation.<sup>8</sup>

1.4 The Government proceeded with the publication of its Energy White Paper in May 2007,<sup>9</sup> but at the same time it also published a new consultation on the Future of Nuclear Power.<sup>10</sup> This consultation closes on 10<sup>th</sup> October 2007. Guidance on how to respond is available from the National Steering Committee at:

<http://www.nuclearpolicy.info/docs/nuclearmonitor/NNM13.pdf>

<sup>1</sup> Energy White Paper: Our energy future – creating a low carbon economy, DTI, Feb 2003  
<http://www.berr.gov.uk/files/file10719.pdf>

<sup>2</sup> Our Energy Challenge – securing clean affordable energy for the long-term, DTI, Jan 2006  
<http://www.berr.gov.uk/files/file25079.pdf>

<sup>3</sup> The Energy Challenge, DTI, July 2006 <http://www.berr.gov.uk/files/file31890.pdf>

<sup>4</sup> Policy Framework for New Nuclear Build, Consultation Document, DTI, July 2006  
<http://www.berr.gov.uk/files/file31931.pdf>

<sup>5</sup> Greenpeace Press Release 5<sup>th</sup> October 2006

<http://www.greenpeace.org.uk/media/press-releases/governments-key-energy-review-declared-legally-flawed>

<sup>6</sup> Greenpeace Press Release 23<sup>rd</sup> November 2006.

<http://www.greenpeace.org.uk/media/press-releases/governments-key-energy-review-on-trial>

<sup>7</sup> Greenpeace Press Release 15<sup>th</sup> February 2007.

<http://www.greenpeace.org.uk/media/press-releases/governments-nuclear-plans-declared-unlawful-by-high-court>

<sup>8</sup> Alistair Darling's Statement 22<sup>nd</sup> February 2007 <http://www.berr.gov.uk/files/file37825.pdf>

<sup>9</sup> Meeting the Energy Challenge: A white paper on energy, DTI, May 2007

<http://www.berr.gov.uk/files/file39387.pdf>

<sup>10</sup> The Future of Nuclear Power: the role of nuclear power in a low carbon economy, DTI, May 2007.

<http://www.berr.gov.uk/files/file39197.pdf>

1.5 Unfortunately, the new Prime Minister, Gordon Brown, at his first Prime Minister's Questions (PMQs) on 4<sup>th</sup> July pre-empted the new consultation when he said: "We have made the decision to continue with nuclear power".<sup>11</sup> Greenpeace lawyers wrote to the Prime Minister demanding he "immediately and unreservedly withdraw the government's decision to support the building of a new generation of nuclear power stations," and that the new consultation be abandoned.<sup>12</sup> The Prime Minister attempted to salvage the situation at PMQs on 11<sup>th</sup> July, by saying he would only decide about new reactors after the consultation.<sup>13</sup>

## 2.0 New Nuclear Reactors – recent developments

2.1 The Future of Nuclear Power consultation invited applications from nuclear vendors interested in having their reactor designs assessed by the nuclear regulators (HSE, the Environment Agency and the Scottish Environment Protection Agency). Vendors needed to apply by 22<sup>nd</sup> June.<sup>14</sup> This initial design assessment could be completed by early 2008, but the whole generic design assessment process is likely to take around three and a half years. At the end of this process, HSE will issue a short statement on the acceptability, in principle, of a licence application. This could then be followed by a formal site-specific licence application.

2.2 This generic design assessment (GDA) is intended to limit the need to examine environmental and safety issues during a planning inquiry, and thus lead to shorter and more predictable site-specific public inquiries with limited public input.<sup>15</sup>

2.3 Four groups of companies asked the regulators to carry out a generic design assessment on four different designs – the European Pressurised Water Reactor (EPR); the Advanced Pressurised Water Reactor (AP1000); the Canadian Advanced CANDU reactor (ACR) and the Economic Simplified Boiling Water Reactor (ESBR).<sup>16</sup>

2.4 The new Department for Business, Enterprise and Regulatory Reform (DBERR) approved all four applications for the opening phase of the generic design assessment, but added that it is likely that only three designs will make it to phase two due to resource constraints.<sup>17</sup> *The Daily Telegraph* said 'sources close to the industry' expect the Canadian ACR to be dropped.<sup>18</sup>

2.5 While few people doubt the Government will conclude more power stations should be built, companies are putting time and money into these applications with no certainty reactors will be ordered. According to the industry journal *Nucleonics Week*, the industry feels justified in paying the relatively small amounts of money for design assessments, site studies, and other pre-development costs, but it is conscious that the really big investment decisions will only have to be taken toward 2012 as the first projects approach the start of construction. A number of "blocks" to new UK nuclear construction will have to be cleared before then.<sup>19</sup>

2.6 Further clarity is needed on waste management arrangements, but the lack of certainty about long-term carbon pricing is a key block to investors' confidence, according to British Energy. At the moment, the private sector and existing suppliers would be extremely reluctant to enter into a long-term investment which

<sup>11</sup> Hansard 4th July 2007, Cm 955

<http://www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070704/debtext/70704-0003.htm>

<sup>12</sup> Letter from Greenpeace lawyers to Gordon Brown dated 5th July 2007

<http://www.greenpeace.org.uk/files/pdfs/nuclear/gplettertobrown050707.pdf>

<sup>13</sup> Hansard 11th July 2007, Cm 1444

<http://www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070711/debtext/70711-0003.htm>

<sup>14</sup> Generic Design Assessment: Latest Developments. HSE May 2007

<http://www.hse.gov.uk/nuclear/reactors/index.htm>

<sup>15</sup> Energy Business Review Online 19th June 2007

[http://www.energy-business-review.com/article\\_news.asp?guid=FB403ED6-A873-4AA8-84F5-8FDA1B7BBAF0](http://www.energy-business-review.com/article_news.asp?guid=FB403ED6-A873-4AA8-84F5-8FDA1B7BBAF0)

<sup>16</sup> World Nuclear News 20th June 2007

[http://www.world-nuclear-news.org/newNuclear/Areva\\_British\\_Energy\\_move\\_for\\_new\\_UK\\_nuclear\\_200607.shtml](http://www.world-nuclear-news.org/newNuclear/Areva_British_Energy_move_for_new_UK_nuclear_200607.shtml)

<sup>17</sup> Forbes 5th July 2007 <http://www.forbes.com/afxnews/limited/feeds/afx/2007/07/05/afx3886476.html>

Dept for Business, Enterprise & Regulatory Reform Press Release 5th July 2007

<http://www.gnn.gov.uk/Content/Detail.asp?ReleaseID=297087&NewsAreaID=2>

<sup>18</sup> Daily Telegraph 9<sup>th</sup> July 2007

<http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2007/07/09/cnatom109.xml>

<sup>19</sup> Pearl Marshall, UK Industry mulls new reactors, *Nucleonics Week*, Vol. 48, No. 26, June 28, 2007

was critically dependent on the cost of carbon. But by 2011, there may be enough confidence about the cost of carbon to make people take the plunge and invest.

2.7 Meanwhile Scottish & Southern Energy and Centrica, have teamed up to submit a joint proposal to British Energy on new reactors, as have German power giants E.On and RWE and their French counterpart EdF. Vattenfall, the Swedish nuclear company, is also understood to have expressed an interest. Areva, the French nuclear group has signed up six companies as possible users of its European Pressure Reactor design, including Suez, the French-Belgian nuclear utility, EDF, E.On, RWE, and Iberdrola, owners of Scottish Power.<sup>20</sup>

### 3.0 Nuclear is not the answer to climate change

3.1 The Government says we need to build around 30-35 GW of new generating capacity over the next two decades - two-thirds by 2020. Around 20GW fossil-fired plant and 10GW nuclear is likely to close over the next twenty years. If all existing nuclear stations were replaced with fossil fuel stations, emissions would be between 8 - 16 MtC/yr higher - equivalent to about 30-60% of the total carbon savings expected from all the measures in the Energy White Paper. Our gas demand would also be higher, at a time when we are becoming more dependent on imports. The Government, however, admits that new reactors are unlikely to be ready much before 2020, but says they could make a significant contribution up to and beyond 2050.

3.2 The notion that nuclear power's potential contribution is essential if we are to tackle climate change has been under attack around the world. A US report, compiled by environmentalists, academics and nuclear industry proponents, concluded that nuclear power couldn't curb climate change without expanding worldwide at the same rate it grew from 1981 to 1990, its busiest decade, and keeping up that rate for 50 years. The report also expressed concern about the nuclear weapons proliferation implications of a global nuclear energy expansion.<sup>21</sup> An Austrian government report says a new reactor building programme would come too late to contribute significantly towards solving climate change. Energy efficiency measures and alternative energies are superior ecologically and economically.<sup>22</sup>

3.3 The Oxford Research Group (ORG's) says if nuclear power were to be able to make a reasonable contribution to combating climate change, and, at the same time taking into account the global increase in population and electricity demand, then around four reactors would have to begin construction every month between now and 2075.<sup>23</sup> This compares to the Nuclear Industry Association's call for construction to begin on around 23 reactors per year – a rate 40% higher than ever achieved before.<sup>24</sup>

3.4 ORG argues that stocks of high-grade uranium are expected to run dangerously low within 25 years. As uranium miners are forced to exploit poorer and poorer quality ores carbon emissions from ore processing may rise significantly. Decision-makers will need a more reliable calculation of how much CO<sub>2</sub> nuclear power would displace. The House of Commons Environmental Audit Select Committee already recommended asking the Royal Commission on Environmental Pollution to report on carbon emissions from different generating technologies, but the Government has so far ignored this.<sup>25</sup> The alternative would be for nuclear operators to separate plutonium from spent nuclear waste fuel to power reactors. Though this will reduce the need for uranium it will also add immensely to the amount of weapons-useable plutonium in circulation.

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<sup>20</sup> Sunday Telegraph 1st July 2007

<http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2007/07/01/cncentrica101.xml>

<sup>21</sup> The full report is online at [www.keystone.org/spp/energy07\\_nuclear.html](http://www.keystone.org/spp/energy07_nuclear.html)

<sup>22</sup> Nuclear Power, Climate Policy and Sustainability available in English from:

<http://umwelt.lebensministerium.at/filemanager/download/20562/>

<sup>23</sup> F Barnaby and J Kemp, Too hot to handle? The future of civil nuclear power, Oxford Research Group, June 2007,

[http://www.oxfordresearchgroup.org.uk/publications/briefing\\_papers/pdf/toohottohandle.pdf](http://www.oxfordresearchgroup.org.uk/publications/briefing_papers/pdf/toohottohandle.pdf)

<sup>24</sup> Letter from Keith Parker to the Guardian, 7<sup>th</sup> July 2007. <http://www.guardian.co.uk/letters/story/0,,2120896,00.html>

It is worth noting that the 1,000 new reactors mentioned by NIA would also require a new Yucca Mountain sized nuclear dump to be opened somewhere every three or four years. See

<http://www.no2nuclearpower.org.uk/reviews/review01.php>

<sup>25</sup> See "Keeping the lights on: Nuclear, Renewables, and Climate Change" (HC 584-1, April 2006):

<http://www.publications.parliament.uk/pa/cm200506/cmselect/cmenvaud/584/58402.htm>

3.6 Of the 20GW of electricity generating capacity which needs to be replaced by 2020, 13GW needs to be replaced by 2015. According to investment analysts UBS UK utilities are preparing to launch another dash for gas to meet this demand which could lead to painful hikes in the cost of energy. The nuclear industry has no hope of opening any new reactors before 2015.<sup>26</sup> Even EDF Energy, the electricity supplier most enthusiastic about investing in new reactors, expects to have only one reactor on stream by 2020. The French company expects to close two coal-fired stations by then - around 4,000MW - because they will become uneconomic under EU emissions regulations, but they will be replaced by two large gas-fired stations, one nuclear station, and renewables, mostly wind, each around 1,000MW.<sup>27</sup>

#### 4.0 Nuclear Finance

4.1 Alistair Darling, the then Secretary of State for Trade and Industry, told the House of Commons Trade and Industry Committee the Government will not subsidise new reactors. If the private sector does not provide the huge investments needed, the country will have to do without. Potential investors complain there is still too much risk to commit to such long-term projects.<sup>28</sup>

4.2 Poyry Energy Consulting (previously Ilex) believes the policies outlined in the Energy White Paper could spell the end of nuclear power.<sup>29</sup> There is little in the way of positive action for delivering the Government's objectives. It needs to set a high and long-term price for CO<sub>2</sub> emissions before there is an economic case for new reactors.<sup>30</sup> An Oxford University task force, complains that the government has no coherent strategy. The hotchpotch of measures is unlikely to deliver the government's vision on climate change, energy security and poverty.<sup>31</sup>

4.3 Meanwhile, the UK Energy Research Centre warns that investment in nuclear and renewables may not be forthcoming because the Government has failed to understand the needs of investors. The academics argue that the Government's objectives rely on the private sector investing tens of billions of pounds. Robert Gross of Imperial College says the Government has somehow to persuade the private sector to invest in nuclear reactors and renewables when what it wants to do is invest in new gas-fired stations. Investors remain sceptical about the appeal of new reactors.<sup>32</sup>

4.5 While the UK Government may be keen to stress that it is leaving the development of new reactors to the free market, there are no such qualms in America. A one-sentence provision buried in an energy bill recently passed by the U.S. Senate could make builders of new nuclear plants eligible for tens of billions of dollars in government loan guarantees. The nuclear industry says it needs as much as \$50 billion in loan guarantees over the next two years to finance a major expansion. The provision, inserted without debate, has the potential to dramatically expand the U.S. industry, which plans to build 28 reactors at an estimated cost of about \$2 - \$2.5 bn apiece.<sup>33</sup>

#### 5.0 Nuclear Waste Management - Background

5.1 After a disastrous series of attempts to find a home for various categories of radioactive waste,<sup>34</sup> in autumn 1994, the UK's radioactive waste body at the time - Nirex - submitted a planning application for its so-called Rock-Characterisation Facility. A public inquiry, lasting five months, was held at the end of 1995, ending on 1st February 1996. Then on 17<sup>th</sup> March 1997, just prior to a General Election, Secretary of State

<sup>26</sup> Power giant race to fill energy gap, by Sam Fleming, Daily Mail 30th May 2007.

<sup>27</sup> FT 5th June 2007 <http://www.ft.com/cms/s/bce825ec-1302-11dc-a475-000b5df10621.html>

<sup>28</sup> Reuters 21st June 2007 <http://uk.reuters.com/article/topNews/idUKL2179895320070621?rpc=401>

<sup>29</sup> Poyry Energy Consulting Press Release 11<sup>th</sup> June 2007.

[http://www.illexenergy.com/pages/White\\_Paper\\_PR\\_11\\_06\\_2007\\_v1\\_0.pdf](http://www.illexenergy.com/pages/White_Paper_PR_11_06_2007_v1_0.pdf)

<sup>30</sup> Reuters 11th June 2007 <http://uk.reuters.com/article/domesticNews/idUKL1113886120070611?rpc=401>

<sup>31</sup> Guardian 4<sup>th</sup> June 2007, <http://business.guardian.co.uk/story/0,2094616,00.html>

Oxford University Press Release 4<sup>th</sup> June 2007 <http://www.admin.ox.ac.uk/po/070604.shtml>

<sup>32</sup> "Investing in Electricity Generation: the role of costs, incentives and risks". UKERC, June 2007.

<http://www.ukerc.ac.uk/content/view/410/014>

<sup>33</sup> International Herald Tribune 31st July 2007 <http://www.ihf.com/articles/2007/07/31/business/nuke.php>

<sup>34</sup> See History of Nuclear Waste Disposal Proposals in Britain, by Pete Roche, 2006.

[http://www.no2nuclearpower.org.uk/reports/waste\\_disposal.php](http://www.no2nuclearpower.org.uk/reports/waste_disposal.php)

for the Environment, John Gummer, rejected the application throwing the nuclear waste programme into chaos, because of scientific uncertainties and technical deficiencies in the proposals. After more than 15 years of work and an expenditure of around £0.5 billion, the elusive search for a solution to the nuclear waste problem was back to square one.

5.2 In May 1997 the new Labour Government was confronted with the need for a completely new policy, so inevitably there was a need for a period of reflection. Consequently decisions were delayed until after the House of Lords Select Committee on Science and Technology reported in March 1999.<sup>35</sup> It recommended an emphasis on public consultation. “Managing Radioactive Waste Safely” – the Government’s consultation document on how to develop its policy – was published in September 2001, followed in 2003 by the establishment of a new Committee on Radioactive Waste Management (CoRWM) to review options in an open, transparent manner, which would inspire public confidence. CoRWM undertook an innovative programme of public and stakeholder debate and consultation.

5.3 CoRWM provided its main recommendations to the Government in July 2006.<sup>36</sup> Although CoRWM said it considered deep geological disposal to be the best available approach for higher activity waste, it also recommended a robust programme of interim storage because of the uncertainties surrounding disposal, and an intensified research programme into the long-term safety of disposal to “reduce uncertainties”. CoRWM recommended a voluntarist approach to selecting a site in which communities would be invited to express a willingness to participate. CoRWM made clear that its recommendations applied to existing waste, and should not be seen as a green light for new reactors, which would extend timescales for implementation and raise political and ethical issues which are quite different from those related to existing waste.

5.4 The Government responded to CoRWM’s recommendations in October 2006,<sup>37</sup> but failed to capture the heavily qualified nature of CoRWM’s recommendation about deep disposal. Rather than ordering an intensified research programme, for example, it said “there is sufficient evidence of the effectiveness of geological disposal”. The concept is certainly not proven for the many thousands of years that containment and isolation of wastes would be required. The Environment Agency lists 10 'key technical challenges' "...where further work is needed before an acceptable repository safety case could be generated."<sup>38</sup>

5.5 The Government ignored CoRWM’s recommendation about wastes from a new nuclear programme. Indeed the High Court criticised the Energy Review consultation document for being “*seriously misleading as to CoRWM’s position on waste from nuclear new build*”. The response document also announced the merger of Nirex with the Nuclear Decommissioning Authority (NDA), thus skipping any consultation on the matter, and rather than establishing an independent oversight body, it promised a reconstituted CoRWM as an advisory body.<sup>39</sup>

## 6.0 Nuclear Waste Management – Recent Developments

6.1 In June 2007 the House of Lords Science and Technology Committee branded the government's preferred institutional framework for dealing with nuclear waste “incoherent and opaque”,<sup>40</sup> and severely criticised the Government’s failure to set up an independent oversight body, calling for the new consultation on nuclear waste management to be postponed until such a body had been established.<sup>41</sup> The Lords complained the Government was moving ahead not with the “steady and measured” progress required, but after “years of procrastination” we now have “unseemly haste”. This is not the way to inspire public confidence.

<sup>35</sup> House of Lords Select Committee on Science and Technology, Management of Nuclear Waste, March 10, 1999. <http://www.publications.parliament.uk/pa/ld199899/ldselect/ldsctech/41/4101.htm>

<sup>36</sup> CoRWM, Managing our Radioactive Waste Safely, Final Report, July 2006. <http://www.corwm.org/pdf/FullReport.pdf>

<sup>37</sup> Response to the Report and Recommendations from the Committee on Radioactive Waste Management (CoRWM) by the UK Government and devolved administrations, 2006. <http://www.defra.gov.uk/environment/radioactivity/waste/pdf/corwm-govresponse.pdf>

<sup>38</sup> [http://www.corwm.org/pdf/1529%20-%20nwat%20\(ea\)%20review%20of%20nirex%20viability%20report%20\(1\).pdf](http://www.corwm.org/pdf/1529%20-%20nwat%20(ea)%20review%20of%20nirex%20viability%20report%20(1).pdf)

<sup>39</sup> Sunday Herald 10<sup>th</sup> December 2006. [http://www.robedwards.com/2006/12/conflict\\_of\\_int.html](http://www.robedwards.com/2006/12/conflict_of_int.html)

<sup>40</sup> Radioactive Waste Management: An Update, House of Lords Science and Technology Committee, June 2007. <http://www.publications.parliament.uk/pa/ld200607/ldselect/ldsctech/109/109.pdf>

<sup>41</sup> BBC 2nd June 2007 [http://news.bbc.co.uk/1/hi/uk\\_politics/6715137.stm](http://news.bbc.co.uk/1/hi/uk_politics/6715137.stm)



6.2 Despite the calls for a postponement, the Government launched a new consultation on June 25<sup>th</sup>, which looks at proposals for the way in which a site will be chosen for a nuclear waste repository.<sup>42</sup> UK Environment Minister, Ian Pearson, said the Government needed to decide how a site would be chosen and was proposing an entirely new approach based on the concept of voluntarism - that is, communities expressing an interest in taking part in the process. The consultation is not asking communities to express an interest yet, that will come later. Rather it is about how to go about calling for expressions of interest from communities, and how a geological disposal facility should be developed. It is about the process. The Government says it anticipates that, in the event that there were new reactors, waste and spent fuel from those stations could be accommodated in the same geological disposal facility – even though this might increase the total radioactivity by a factor of nearly three.<sup>43</sup>

6.3 In an unprecedented move the Scottish government refused to endorse the consultation process and said it ruled out allowing deep disposal in Scotland.<sup>44</sup> The Scottish cabinet secretary for rural affairs and the environment, Richard Lochhead, recognised that dealing with legacy waste is a significant challenge but said the Scottish government does not accept it is right to seek to bury nuclear waste, which will remain active for thousands of years, in a deep geological facility or to expect any community to host such a facility.<sup>45</sup> However, the new Scottish government remains fully committed to working closely with the UK government in important aspects of radioactive waste policy and to supporting CoRWM's recommendations on interim storage and further joint research on other management options.<sup>46</sup> The Scottish government will be involved in establishing the re-vamped CoRWM, which is currently being established.

6.4 Writing in *The Scotsman*, Gordon Mackerron, the outgoing CoRWM chair accused Scottish Ministers of putting at risk CoRWM's whole package of recommendations. He warned against cherry picking from CoRWM's "interdependent and inseparable package of measures" lest the whole ball of string unravels, setting us back to where we were before CoRWM was formed. It has taken fifty years to get this far and it could easily take a further fifty to put in place all the components for geological disposal.<sup>47</sup> However, not all of the Committee agrees with Mackerron. Pete Wilkinson backs the Scottish Executive's decision not to take part in a consultation over deep disposal. "It is a valid and justifiable policy," he said. "It does not, in my view, represent cherry picking since if you remove disposal as the potential end point, the recommendations still stand since disposal is only one possible outcome."<sup>48</sup>

6.5 In fact, Wilkinson says, it is the Westminster government which has been cherry picking by "ignoring" CoRWM's integrated package of recommendations on research and interim storage. "By concentrating on disposal and the search for a repository site to the exclusion of other recommendations, Westminster is unfairly favouring disposal when a research programme may demonstrate no societal consensus for that management option."

6.6 Gordon MacKerron himself has highlighted the lack of any visible progress on CoRWM's recommendation about the need for a major R&D programme on disposal to "reduce uncertainties" and robust interim storage.<sup>49</sup> A new briefing for the Nuclear Free Local Authorities called "Deep Geological Disposal: known unknowns", by Dr Rachel Western, argues that CoRWM's emphasis on research to "reduce uncertainty" is wrong. A genuine scientific programme would be concerned with evaluating whether a disposal programme can be implemented safely – not 'reducing uncertainties' which sounds very much like

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<sup>42</sup> DEFRA Press Release 25th June 2007

<http://www.gnn.gov.uk/Content/Detail.asp?ReleaseID=294304&NewsAreaID=2>

<sup>43</sup> Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal, DEFRA, 25<sup>th</sup> June 2007.

<http://www.defra.gov.uk/corporate/consult/radwaste-framework/consultation.pdf>

<sup>44</sup> Nuclear Engineering International 25th June 2007

<http://www.neimagazine.com/story.asp?sectioncode=132&storyCode=2045263>

<sup>45</sup> Scotsman 26th June 2007 <http://thescotzman.scotsman.com/politics.cfm?id=994422007>

<sup>46</sup> Scottish Executive Press Release 25<sup>th</sup> June 2007 <http://www.scotland.gov.uk/News/Releases/2007/06/25101822>

<sup>47</sup> Scotsman 30th June 2007 <http://thescotzman.scotsman.com/opinion.cfm?id=1021622007>

<sup>48</sup> RobEdwards.com 12<sup>th</sup> August 2007 <http://www.robedwards.com/2007/08/uk-attacked-ove.html>

<sup>49</sup> Future R&D Needs, by Gordon MacKerron, CoRWM, June 2007.

<http://www.corwm.org.uk/pdf/2209%20-%20Future%20RD%20needs.pdf>

the outcome of the research is being prejudged.<sup>50</sup>

6.7 A nuclear dump site is expected to take up to five years to identify, with 15-20 years before any construction work starts and possibly 30 years before the first waste is transported there. Communities on any shortlist of sites could expect generous "community benefit packages", described by opponents of nuclear dumping as "bribes". *The Guardian's* description of West Cumbria as the favourite site<sup>51</sup> upset Chris McDonald, the lead inspector of the 1995-96 Nirex public inquiry who said the evidence from the Inquiry was that the safety case for a dump near Sellafield showed the site is not suitable and investigations should be moved elsewhere.<sup>52</sup>

## 7.0 Nuclear Accidents

7.1 It has been a bad couple of months for the nuclear industry around the world. An earthquake in Japan and two fires in Germany have both reminded the public of the potential for accidents, but it was the public relations mistakes made by the industry that caused the real problems.

7.2 Until June nuclear power seemed to be making its way back into public favour in Germany. People appeared to be beginning to believe that carbon emissions might be a bigger danger than nuclear accidents or radioactive waste. Opinion polls this spring showed fewer than half Germans favoured continuing with the nuclear phase out policy. All that changed at the end of June, with two separate accidents at nuclear plants operated by Vattenfall, a Swedish state-owned company. The mishaps themselves seemed fairly minor but Vattenfall botched its public relations (and later sacked its German boss). Now public support for the phase-out has climbed back over 50%.<sup>53</sup>

7.3 A fire broke out at the Krümmel reactor near Hamburg in the reactor's transformer on June 28, but the company wrongly reported the incident had not affected the reactor itself. Miscommunication during the incident likewise led to the plant being shut down. On the same day, an incident at the nearby Brunsbüttel reactor led to that plant being shut down as well. Vattenfall proved slow to cooperate with German authorities in clearing up the incidents.<sup>54</sup>

7.4 Similarly, in Japan, first, the world was told the earthquake in July had caused a small fire at the Kashiwazaki-Kariwa nuclear plant, but no radioactivity was released. Then Tokyo Electric Power Company (Tepco) admitted a leak, but said it was only 1.5 gallons of radioactive water. Later, it emerged that the water was far more radioactive than first thought and nearly 100 nuclear waste barrels had fallen over - but only a couple of dozen lost their lids and leaked low-grade nuclear waste. This was later changed to 400 barrels and a significant release of cobalt-60, chromium-51 and radioactive iodine. Finally there was confirmation the world's biggest nuclear power plant was built bang on top of an active fault line but was not structurally equipped to withstand such a powerful earthquake.<sup>55</sup>

7.5 German Green MEP, Rebecca Harms, says these incidents have shown that nuclear energy is not the modern high technology sector portrayed by the industry itself.<sup>56</sup> Aging reactors, an inability to prepare for natural disasters and a questionable safety culture pose a permanent risk. We can lull ourselves into a false sense of security, but the fact that there has not been a major accident recently does not mean that it will never happen again. Every year there are thousands of incidents, occurrences and events in nuclear installations and, simply because there was no catastrophic radioactive leakage, the world reacts as if there was no problem.<sup>57</sup>

<sup>50</sup> Radioactive Waste Policy Briefing No.15, Nuclear Free Local Authorities.

<http://www.nuclearpolicy.info/docs/radwaste/RWB15.pdf>

<sup>51</sup> Guardian 25th June 2007 [http://www.guardian.co.uk/uk\\_news/story/0,2111332,00.html](http://www.guardian.co.uk/uk_news/story/0,2111332,00.html)

<sup>52</sup> Guardian letters 28th June 2007 <http://www.guardian.co.uk/letters/story/0,2113027,00.html>

<sup>53</sup> Economist 2nd August 2007 [http://www.economist.com/world/europe/displaystory.cfm?story\\_id=9595481](http://www.economist.com/world/europe/displaystory.cfm?story_id=9595481)

<sup>54</sup> Spiegel Online 16th July 2007 <http://www.spiegel.de/international/germany/0,1518,494734,00.html>

<sup>55</sup> Guardian 25th July 2007 <http://society.guardian.co.uk/societyguardian/story/0,2133542,00.html>

<sup>56</sup> New Statesman 23rd July 2007 <http://www.newstatesman.com/200707230005>

<sup>57</sup> For a longer report on accidents since Chernobyl, commissioned by Rebecca Harms MEP see Residual Risks at: [http://www.greens-efa.org/cms/topics/dokbin/181/181995.residual\\_risk@en.pdf](http://www.greens-efa.org/cms/topics/dokbin/181/181995.residual_risk@en.pdf)

## 8.0 Sellafield

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

8.2 Reprocessing is the chemical separation of plutonium and unused uranium from spent nuclear waste fuel. It is only one management option used for around one sixth of spent fuel generated worldwide. It is a completely unnecessary process. The bulk of radioactive discharges going into the North-East Atlantic originate from Sellafield.

8.3 The older of the two reprocessing plants is the Magnox reprocessing plant, also known as B205. This reprocesses spent fuel from Britain's first generation Magnox reactors, owned by the Nuclear Decommissioning Authority. Only two of these reactors remain operational. Oldbury in Gloucestershire is planned to close in 2008, and Wylfa on Anglesey in 2010. The reprocessing plant is expected to close around the end of 2012.

8.4 The newer of the two reprocessing plants is THORP – the Thermal Oxide Reprocessing Plant. THORP started operations in 1994 to reprocess spent fuel from Britain's newer Advanced Gas-cooled Reactors (AGRs) now owned by British Energy, and overseas Light Water Reactors (LWRs). THORP closed on 21st April 2005 because of the spillage of 18,000 litres of highly radioactive liquid waste which began seeping from a broken pipe around July 2004. The pipe then suffered a major fracture around January 2005. Although no radiation escaped, British Nuclear Group (BNG), the company operating Sellafield on behalf of the Nuclear Decommissioning Authority (NDA), should have been able to discover the leak "within days". Yet it continued undetected for around eight months.<sup>58</sup> A criminal case, brought by the Health & Safety Executive (HSE) was heard by the Crown Court in Carlisle in October 2006, and BNG was fined £500,000 after pleading guilty. This was on top of a £2m penalty imposed on BNG by the NDA.<sup>59</sup> Although BNG received consent to restart operations at THORP from the Nuclear Installations Inspectorate in January 2007 the plant is still not fully operational.

8.5 The NDA's Lifetime Plan for Sellafield, shows THORP operations finishing in March 2011. But with some 4000 tonnes of contracted fuel (Overseas and British Energy) still to be reprocessed by that date, the plant faces the impossible challenge of reprocessing at almost double the rate it has averaged since operations commenced in 1994.

8.6 Meanwhile the Sellafield MoX Plant (SMP) completed its latest order for the Beznau nuclear station in Switzerland around 1 year late. BNG blamed equipment reliability problems for the delay.<sup>60</sup> Because MoX fuel contains weapons-useable plutonium, security is a problem when this fuel is delivered to customers. The final batch of Swiss fuel was transported under armed guard from Sellafield to Workington and then loaded on to the Atlantic Osprey, an armed, converted roll-on roll-off cargo vessel, for shipment to Cherbourg.<sup>61</sup> These armed convoys would become much more common on our roads if it was decided to use up Britain's embarrassing stockpile of weapons-useable plutonium to manufacture MoX fuel for use in new reactors.

8.7 Because THORP has been out of action for over two years the Department of Trade and Industry (DTI) launched a public consultation in June into proposals to allow advance allocation of THORP reprocessing products to overseas customers in certain circumstances.<sup>62</sup> In other words overseas customers could receive an allocation of plutonium, uranium and waste from British stocks which is equivalent to their spent fuel consignment although their materials may not yet have been reprocessed yet. With around 800 tonnes of

<sup>58</sup> See Energy Review Update No. 4 <http://www.no2nuclearpower.org.uk/reports/ERNewsletterNo4.pdf>

<sup>59</sup> Telegraph 17 Oct 2006 <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/10/17/npipe17.xml>

<sup>60</sup> Platts Nuclear News Flashes 20th April 2006.

<sup>61</sup> Whitehaven News 22nd March 2007 <http://www.whitehaven-news.co.uk/news/viewarticle.aspx?id=479243> And Platts Nuclear News Flashes, 26th March 2007.

<sup>62</sup> NDA website 14th June 2007 <http://www.nda.gov.uk/news/advance-allocation.cfm>

DTI Consultation Document 14th June 2007 [Responses required by 26th July] <http://www.dti.gov.uk/files/file39759.pdf>



overseas spent fuel still waiting to be reprocessed at THORP if or when it re-starts, some observers are questioning why – if this “virtual” reprocessing is approved, the plant needs to be re-opened at all. With sufficient plutonium and other materials for customers’ needs already stockpiled at Sellafield – none of the outstanding spent fuel needs to be reprocessed.<sup>63</sup>

8.8 Meanwhile the Energy White Paper says new nuclear power stations should proceed on the basis that spent fuel will not be reprocessed.<sup>64</sup> But Sean Balmer, of the NDA says operators of potential UK reactors should make their calculations on the “premise” that reprocessing is not an option, because the government “can’t guarantee” that reprocessing facilities will be available. Clearly the government does not want the reprocessing issue to “derail” efforts to build support for construction of new reactors. Mark Higson of the DTI was asked at a London Conference why the government was ruling out future reprocessing when the US “is starting to take steps toward recycling.” He said “ruling out” was probably “too strong” an expression. If at some stage in the future, nuclear operators come forward with reprocessing proposals things may change.<sup>65</sup>

8.9 Cumbrian beaches have been declared officially safe from radioactive contamination after checks deep into the sand. New highly sensitive monitoring equipment has discovered many more objects contaminated by radioactivity from Sellafield. Cumbrian anti-nuclear group Core said another 69 contaminated objects had been unearthed, and the discoveries beg the question about what else has been missed in the past. The Environment Agency says that most of the “finds” of pebbles, particles and beach debris relate to historic events on the Sellafield site.<sup>66</sup> SEPA says it has stepped up monitoring on the Solway Coast.<sup>67</sup>

8.10 Meanwhile Geoffrey Minter, owner of Sandside Beach near Dounreay (see below) puts the Cumbrian particles in context. The highest activity Caesium 137 particle on the much larger beaches near Sellafield (Cs 137 is a component of the Sandside particles) has an activity of 130,000 Becquerels (Bq). For comparison, the highest activity Caesium 137 particle officially declared at Sandside so far is 500,000 Bq. Only about five per cent of the public beaches near Sellafield have been surveyed by the groundhog monitoring vehicles used in Caithness.<sup>68</sup>

## 9.0 Dounreay

9.1 Dounreay has been a centre for fast breeder reactor research and development since 1954. It was hoped that fast reactors would be able to make more efficient use of uranium fuel when generating electricity – effectively breeding more fuel than consumed. However, fast reactors around the world have been beset with technical problems. Two fast reactors were built at the site: the Dounreay Fast Reactor (DFR), with its famous dome, operated from 1959 to 1977, and the larger Prototype Fast Reactor (PFR), which operated from 1974 to 1994. There was also a materials test reactor (DMTR) which operated from 1958 to 1969. Funding for the Dounreay research programme ceased and the last reactor was shut down in 1994. The site was also home to a variety of waste facilities including a fast reactor fuel reprocessing facility. Reprocessing of PFR fuel continued until 1996. Dounreay also manufactured highly enriched uranium (bomb-grade) fuel elements for use in overseas research reactors and reprocessed some overseas highly-enriched uranium research reactor spent fuel. In the late 1990s UK Atomic Energy Authority (UKAEA) stopped new commercial work to concentrate on decommissioning the site.

9.2 Despite fears about the economic impact of decommissioning, UKAEA claims it has brought a new lease of life to the area and increased employment levels by pioneering environmental restoration. In 2000, UKAEA published the Dounreay Site Restoration Plan, which was one of the world’s first blueprints for the

<sup>63</sup> CORE Briefing (02.07) 18<sup>th</sup> June 2007 <http://www.corecumbria.co.uk/>

<sup>64</sup> RobEdwards.com 23rd May 2007 [http://www.robedwards.com/2007/05/uk\\_signals\\_aban.html](http://www.robedwards.com/2007/05/uk_signals_aban.html)

<sup>65</sup> Nuclear Fuel, 18th June 2007

<sup>66</sup> Whitehaven News 19th July 2007 <http://www.whitehaven-news.co.uk/news/viewarticle.aspx?id=521417>

<sup>67</sup> Dumfries & Galloway Standard 25th July 2007

[http://icdumfries.icnetwork.co.uk/dumfriesgalloway/news/tm\\_headline=nuclear-testing-planned%26method=full%26objectid=19518110%26siteid=77296-name\\_page.html](http://icdumfries.icnetwork.co.uk/dumfriesgalloway/news/tm_headline=nuclear-testing-planned%26method=full%26objectid=19518110%26siteid=77296-name_page.html)

<sup>68</sup> John O’Groat Journal 1st August 2007

[http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2723/Radioactivity\\_levels.html](http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2723/Radioactivity_levels.html)

restoration of a major nuclear site. This has now been superseded by the Life Time Plan, submitted annually to the NDA, which now owns the site.

9.3 Restoring the 140-acre Dounreay site is one of the most complex decommissioning tasks in the world. The site's history in fast reactor and fuel cycle development presents significant decommissioning challenges including: the Dounreay shaft - an underground shaft used for disposal of solid radioactive waste from 1959 until 1977, when an explosion occurred - considered one of the greatest decommissioning challenges in the UK. The decommissioning programme is expected to be completed by 2033 at a cost of £2.9 billion.

9.4 Regrettably, at some point in the past, fragments of irradiated nuclear fuel were released from the Dounreay site into the sea. Although most of the particles remain on the seabed in sediment, they continue to arrive on beaches in Caithness. A single particle was found on Dunnet beach in March 2005, and one on Murkle beach in April 2007. But hundreds have been found on the Dounreay foreshore and 94 particles, including 17 this year, have been removed from Sandside.<sup>69</sup>

9.5 The UKAEA is in the process of deciding how to implement an acceptable clean up strategy, both onshore and offshore. Over the next few months a preliminary Best Practicable Environmental Option (BPEO) report will be published for public comment. Then UKAEA will make recommendations to SEPA and the NDA in early 2008.<sup>66 70</sup>

9.6 Sandside Beach is privately owned, but with public access. The owner has, from time to time withdrawn permission for the UKAEA to carry out radiation monitoring, mainly because he is dissatisfied with the quality of the clean-up programme. Most recently, radiation surveyors were allowed to resume monitoring at the beginning of August after a four-month impasse.<sup>67 71</sup>

9.7 In June plutonium was discovered in the manhole of a groundwater drain at the site. This was of particular concern because the manhole discharges onto the nearby foreshore. In another embarrassing development Dounreay was landed with a £1.7million bill after selling almost three tonnes of heavy-metal thorium to a company in Peru in a secret deal almost 10 years ago. But the waste has now been returned to Scotland. The 2.9tonne load was dispatched to the Lima-based firm in July 1998 for use in the production of gas mantles. However, just two months later, the Peruvian company complained that the material was unusable because it was contaminated with copper, aluminium and 600 grams of enriched uranium-235, which is potentially deadly.<sup>72</sup>

9.8 In July the UKAEA were fined £15,000 for exposing two employees to potentially deadly plutonium, as they disposed of contaminated bricks in a laboratory. Wick Sheriff Court heard that the incident occurred in a former fuel processing plant on January 12<sup>th</sup> 2006.<sup>73</sup>

9.9 The Government is planning to sell off the nuclear decommissioning division of UKAEA, to raise up to £400m. US engineering giants such as CH2M Hill, Bechtel and Fluor, as well as UK services company Amec, are all likely to be interested. UKAEA employs 2,300 people and receives around £300m a year from the NDA to clean up sites including Dounreay. The research division, which leads UK research into nuclear fusion and is involved in the international venture to build a €4bn (£2.7bn) test facility in France, will remain in government hands.<sup>74</sup>

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<sup>69</sup> John O Groat Journal 18th April 2007

[http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2005/Murkle\\_radioactive\\_particle\\_confirmed.html](http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2005/Murkle_radioactive_particle_confirmed.html)

<sup>70</sup> John O' Groat Journal 4th April 2007

[http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/1917/Particles\\_issue:\\_UKAEA\\_vows\\_'substantial\\_progress'.html](http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/1917/Particles_issue:_UKAEA_vows_'substantial_progress'.html)

<sup>71</sup> John O' Groat Journal 10th August 2007

[http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2781/Surveyors\\_resume\\_work\\_at\\_Sandside.html](http://www.johnogroat-journal.co.uk/news/fullstory.php/aid/2781/Surveyors_resume_work_at_Sandside.html)

<sup>72</sup> BBC 8th August 2007 [http://news.bbc.co.uk/1/hi/scotland/highlands\\_and\\_islands/6937923.stm](http://news.bbc.co.uk/1/hi/scotland/highlands_and_islands/6937923.stm)

<sup>73</sup> Aberdeen Press and Journal 13th July 2007

<http://www.thisisnorthscotland.co.uk/displayNode.jsp?nodeId=149664&command=displayContent&sourceNode=149490&contentPK=17822382&folderPk=85696&pNodeId=149221>

<sup>74</sup> Independent on Sunday 15th July 2007 <http://news.independent.co.uk/business/news/article2770929.ece>

## 10.0 Miscellaneous

10.1 Every year six convoys, each of about 10 vehicles, carry loads of nuclear warheads and explosives some 400 miles by public roads from Berkshire to Faslane and Coulport. It has now been revealed that there have been 50 "engineering incidents" and 17 "operational accidents" to convoy vehicles on Scottish roads in the past seven years.<sup>75</sup> Green party leader Robin Harper has demanded an inquiry into roads being used to transport nuclear weapons.<sup>76</sup> The convoys often travel around Edinburgh's By-pass.<sup>77</sup> See <http://uk.youtube.com/watch?v=tCx-8PAiK8Q>

10.2 Rates of leukaemia are higher in children and young people living near nuclear plants, a review of several studies has concluded. Death rates for children aged nine and under were up to 24 per cent higher, depending on how near they lived to nuclear facilities. Researchers reviewed 17 different studies, including seven from the UK, carried out between 1984 and 1999, to compile the statistics. The other studies came from Canada, France, Germany, the US, Japan and Spain.<sup>78</sup>

10.3 Greenpeace has release a nine minute film which explains why nuclear power can't stop climate change and points the way to a better, cheaper, more convenient solution. See: <http://www.greenpeace.org.uk/climate/the-convenient-solution>

10.4 British Energy has warned it is unlikely to regain full power at its troubled Hunterston nuclear station in Ayrshire. The two Hunterston B reactors were shut down for four months earlier this year following boiler problems, and are now running at around 70 per cent power.<sup>79</sup>

10.5 Construction of the EPR reactor at Olkiluoto 3 in Finland has fallen even further behind schedule. Initially due to be operational in mid-2009, the project has been plagued by delays. The previously announced 18 month delay has now been extended to around two years because fortifying the reactor building against an air plane crash is taking longer than anticipated.<sup>80</sup>

10.6 A SEPA consultation closed in July on an application by Rosyth Dockyard to send contaminated metal to a processing facility operated by Studsvik in Sweden. The waste will be smelted and the recovered uncontaminated metal will be available for reuse. Radioactive contaminants removed during the smelting process and any secondary radioactive wastes such as filters will be returned to RRDL for subsequent disposal at Drigg in Cumbria.<sup>81</sup> Meanwhile Cumbrian County Councillors have given the go-ahead for a £6m decontamination centre to be built by Studsvik near Workington.<sup>82</sup>

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<sup>75</sup> Sunday Herald 15<sup>th</sup> July 2007

[http://www.sundayherald.com/news/heraldnews/display.var.1546342.0.nuclear\\_convoy\\_in\\_67\\_scottish\\_safety\\_incidents.php](http://www.sundayherald.com/news/heraldnews/display.var.1546342.0.nuclear_convoy_in_67_scottish_safety_incidents.php)

<sup>76</sup> Scotland on Sunday 5th August 2007 <http://scotlandonsunday.scotsman.com/politics.cfm?id=1223842007>

<sup>77</sup> Edinburgh Evening News 7th August 2007 <http://news.scotsman.com/scotland.cfm?id=1236782007>

<sup>78</sup> Scotsman 19th July 2007 <http://news.scotsman.com/index.cfm?id=1122522007>

<sup>79</sup> Edinburgh Evening News 20th July 2007 <http://edinburghnews.scotsman.com/business.cfm?id=1133172007>

<sup>80</sup> Energy Business Review 13th August 2007

[http://www.energy-business-review.com/article\\_news.asp?guid=80B1249C-4590-4A5A-A624-AC9AD3901FA2](http://www.energy-business-review.com/article_news.asp?guid=80B1249C-4590-4A5A-A624-AC9AD3901FA2)

<sup>81</sup> [http://www.sepa.org.uk/consultation/current/rad\\_rosyth/index.htm](http://www.sepa.org.uk/consultation/current/rad_rosyth/index.htm)

<sup>82</sup> Whitehaven News 28th July 2007

<http://www.whitehaven-news.co.uk/news/viewarticle.aspx?id=525940>