

Nuclear reactor siting

Introduction

After 10 years in power, the Government appears to have embraced the nuclear option with gusto. On 10th January 2008 it published a White Paper¹ which confirmed its “preliminary view” that new reactors should go-ahead and invited energy companies to bring forward plans to build and operate them. It said it believes it is in the public interest to allow energy companies the option of investing in new nuclear power stations. The Government also said it would take active steps to open up the way to the construction of new nuclear power stations.²

Energy Secretary John Hutton, who was described by *Nuclear Engineering International* magazine as seeming “*to be pushing harder than the industry for new nuclear*”, said building more reactors was “*a total no brainer*” and added that his department is “*totally focused [on] key areas for facilitating fast track investment*”.³

But new reactors are not going to start springing up very quickly – the ‘facilitative actions’ Hutton talks about will take time to be implemented.

Generic design assessment

The nuclear regulators – the Health and Safety Executive (HSE) and Environment Agency – have been carrying out a new process called 'Generic Design Assessment' (GDA), which looks at the safety, security and environmental implications of new reactor designs before an application is made to build that design at a particular site.⁴ In March 2008, the initial assessment of four nuclear power station designs was completed. No shortfalls in any of the four designs were found. A series of reports on each design were published.⁵

The next stage was going to be a prioritisation process to select a maximum of three reactor designs to proceed to the next stage of the assessment, but Atomic Energy of Canada Ltd announced in April 2008 that it was pulling its ACR-1000 design out of the process to focus on its home market.⁶ Then in September 2008 General Electric's nuclear venture with Hitachi Ltd. asked the HSE to temporarily halt the process of assessing its so-called Economic Simplified Boiling Water Reactor so that it could focus its efforts on getting U.S. approval instead.⁷ This left only the Toshiba-Westinghouse AP1000 design and the Areva-Siemens European Pressurised Water Reactor (EPR) in the assessment process.

¹ Meeting the Energy Challenge: A White Paper on Nuclear Power, BERR, January 2008.

<http://www.berr.gov.uk/files/file43006.pdf>

² BERR Press Release 10th January 2008,

<http://nds.coi.gov.uk/environment/fullDetail.asp?ReleaseID=343892&NewsAreaID=2&NavigatedFromDepartment=True>

³ Britain's no brainer, Nuclear Engineering International, June 2008.

⁴ See <http://www.hse.gov.uk/newreactors/>

⁵ The Design Assessment Reports can be viewed at <http://www.hse.gov.uk/newreactors/>

Builder and Engineer 18th March 2008

<http://www.builderandengineer.co.uk/news/environment/designs-for-nuclear-stations-clear-first-hurdle-1736.html>

⁶ Toronto Star 5th April 2008 <http://www.thestar.com/Business/article/410418>

⁷ Bloomberg 17th September 2008

http://www.bloomberg.com/apps/news?pid=20601101&sid=a4bBI51_pzjk&refer=japan

The GDA process is likely to take around 3.5 years from start to finish, taking us up to around the spring of 2011. At the end of the process the regulators will make statements setting out their conclusions about the acceptability of the designs.⁸

Funding provision for nuclear decommissioning

A draft framework on how decommissioning and waste costs would be paid for was published in February 2008, and consultation closed on 16th May 2008,⁹ and the Government responded to the consultation in September 2008.¹⁰ Companies must produce a detailed funded decommissioning programme before new reactors are approved. This will include a commitment to pay into a secure and independently managed fund to cover all the costs of decommissioning, clean up and disposing of the waste.

A Nuclear Liabilities Financing Assurance Board will be set up, under the Energy Bill 2008, to monitor these funds¹¹ and provide advice to the Government on all aspects of the financial arrangements operators plan to put in place.¹² The Bill has completed its report stage in the House of Lords and is expected to be completed after the 2008 summer recess. The arrangements will give nuclear operators a fixed price they are required to pay for waste and decommissioning, leaving the taxpayer with all of the risk (see NuclearSpin briefing on nuclear costs and finance).

Justification process

In March 2008 the Government invited nuclear power companies to put forward new designs for a justification decision for nuclear reactors, and BERR issued Guidance for companies wishing to apply.¹³ The Justification Process is part of European Union regulation that requires the assessment of each design before it can be used in the UK. Companies hoping to build new reactors must show that the benefits of using their reactor designs outweigh the potential health risks. The Government said it wanted applications before the beginning of June. The process is expected to take about 18 months to complete, taking us up to the middle of 2009.¹⁴

In response, the Secretary of State for BERR received an application from the Nuclear Industry Association on behalf of those energy utilities that have expressed an interest in developing nuclear power in the UK.¹⁵ BERR will be publishing a package of information,

⁸ HSE Press Release 18th March 2008

<http://nds.coi.gov.uk/Content/Detail.asp?ReleaseID=361424&NewsAreaID=2>

⁹ Consultation on Funded Decommissioning Programme Guidance for New Nuclear Power Station, BERR, February 2008 <http://www.berr.gov.uk/files/file44486.pdf>

Telegraph 22nd February 2008

<http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/02/22/eanuc122.xml>

¹⁰ The Government Response to the Consultation on Funded Decommissioning Programme Guidance for New Nuclear Power Stations, BERR September 2008. <http://www.berr.gov.uk/files/file47629.pdf>

¹¹ FT 22nd February 2008 <http://www.ft.com/cms/s/0/70bd3824-e0d4-11dc-b0d7-0000779fd2ac.html>

¹² Modern Power Systems 17th January 2008

<http://www.modernpowersystems.com/story.asp?sectioncode=131&storyCode=2048395>

¹³ The Justification of Practices involving Ionising Radiation Regulations 2004: Guidance for applications relating to new nuclear power, BERR, March 2008.

<http://www.berr.gov.uk/files/file45384.pdf>

¹⁴ Forbes 31st March 2008 <http://www.forbes.com/markets/feeds/afx/2008/03/31/afx4833538.html>

Reuters 31st March 2008

<http://uk.reuters.com/article/domesticNews/idUKL314396220080331?rpc=401&feedType=RSS&feedName=domesticNews&rpc=401>

¹⁵ NIA Justification Application

<http://www.defra.gov.uk/environment/radioactivity/government/legislation/pdf/nia-application.pdf>

including the application, later in 2008 for comment, and will issue a draft decision document for consultation.

The planning process

The Government says it will use the Planning Bill to speed up nuclear development. The Bill finished its third reading in the House of Commons in June, and will start its committee session in the House of Lords in October 2008. The Bill aims to establish a streamlined procedure for approving large infrastructure projects including power stations. Once the Strategic Siting Assessment (SSA – see below) has identified sites that are strategically suitable for new reactors by the end of 2025, the list will be included in a National Policy Statement for Nuclear Power (Nuclear NPS). This Policy Statement will establish the need for new reactors, so the subsequent planning process will only deal with site specific issues.

The Bill will also create the Infrastructure Planning Commission (IPC) which will decide on projects of national significance for England and Wales. The IPC will act according to the National Policy Statements drawn up by the Government. National Policy Statements will be subject to public consultation and developers will be required to consult affected communities before submitting planning applications.¹⁶ But public inquiries, conducted by the IPC, will be conducted in writing, and there will be no public right for objectors to cross examine developers.¹⁷ Greenpeace and the Campaign to Protect Rural England called it a "developer's charter" which stripped away the public right to a say.¹⁸

Other facilitative actions

The Government also says it is working to strengthen the EU Emissions Trading Scheme so that investors have confidence in a meaningful, long-term carbon price.

On nuclear waste the Government has issued a White Paper which sets out the framework for implementing geological disposal.¹⁹ This asks local authorities in England and Wales to consider hosting a nuclear waste dump in deep underground vaults in return for government investment in jobs, road improvements and health screening - widely reported as 'bribes' (see NuclearSpin briefing on nuclear waste)

Strategic Siting Assessment

The Government is carrying out a Strategic Siting Assessment (SSA). This will identify possible sites for new reactors, but won't be completed until the end of 2009. Firstly the criteria that will be used to assess the suitability of sites nominated for new nuclear power stations have to be consulted on. The criteria will also be used to rule out areas of the country where there are no suitable sites. On 22 July 2008, the Government issued a consultation document on its SSA process and criteria together, with a study of the potential environmental

¹⁶ FT 7th Nov 2007 <http://www.ft.com/cms/s/0/fb47d61a-8c98-11dc-b887-0000779fd2ac.html>

¹⁷ See FoE Briefing on the Planning Bill, December 2007.
http://www.foe.co.uk/resource/briefings/plan_bill_campaigner_brief.pdf

¹⁸ Guardian 7th Nov 2007 <http://www.guardian.co.uk/guardianpolitics/story/0,2206381,00.html>

¹⁹ Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal, DEFRA, BERR, Devolved Administrations for Wales and Northern Ireland, June 2008
<http://www.defra.gov.uk/environment/radioactivity/mrws/pdf/white-paper-final.pdf>

and sustainability effects of the siting criteria.²⁰ The consultation will run until 11 November 2008.

Once the criteria have been developed, third parties will be invited to nominate potentially suitable sites.

The consultation on draft SSA criteria was promised for March 2008, but was still not out in time for a major nuclear investors' conference in June, so the Government published a draft list of the SSA criteria, along with an assessment timetable.²¹ This indicates the process has suffered delays already.

Final criteria and invitations to nominate sites are expected to be issued at the beginning of 2009. In mid-2009 a list of nominated sites would be issued as part of a consultation on the National Policy Statement for new nuclear power. The finalised National Policy Statement will then be published at the beginning of 2010.

Site licence

To construct and operate a nuclear power station in the UK, a nuclear site licence must be granted by the Health and Safety Executive (HSE).²² HSE anticipates that most potential reactor operators will use a design which has completed the GDA process before submitting a site licence application. On the assumption that the GDA process has been completed, the licensing process would be expected to take around one year from application to completion. The Government expects potential operators of the first new reactors to apply for a site licence around the beginning of 2011, with approval granted in early 2012. This process can run concurrently with the planning process.

The licence application must include, amongst other things: evidence showing that the reactor is 'justified' as required by the Justification of Practices Involving Ionising Radiation Regulations 2004; evidence the site complies with UK Government siting policies (in other words it would have to be a site included on the list of potential sites in the National Policy Statement); a statement on the decommissioning arrangements; and a pre-construction safety report.²³

Nuclear siting

In his book, *Nukenomics*²⁴, Ian Jackson, who was author of a report²⁵ on reactor siting published alongside the 2007 Energy White Paper, notes: "With their winning combination of available land, grid access and close proximity to markets, the five prime locations are generally regarded as British Energy's Hinkley Point, Sizewell and Dungeness along with the Nuclear Decommissioning Authority's (NDA's) Bradwell and Wylfa sites". Jackson suggests

²⁰ Towards a National Nuclear Policy Statement: Consultation on the Strategic Siting Assessment Process and Siting Criteria for New Nuclear Power Stations in the UK, BERR, July 2008.

<http://www.berr.gov.uk/files/file47136.pdf>

²¹ Strategic Siting Assessment: Preview of Nominations and Assessment Process, Draft Exclusionary and Discretionary Criteria and Indicative Timeline, BERR June 2008

<http://www.berr.gov.uk/files/file46596.pdf>

²² Applying for a nuclear site licence for new nuclear power stations: A step-by-step guide, HSE, August 2008 <http://www.hse.gov.uk/newreactors/application.pdf>

²³ See 21.

²⁴ <http://www.no2nuclearpower.org.uk/reviews/review03.php>

²⁵ Siting New Nuclear Power Stations: Availability and Options for Government, Jackson Consulting, 26th April 2006 Published by BERR 23rd May 2007. <http://www.berr.gov.uk/files/file39030.pdf>

that Hinkley and Sizewell may both be suitable for two new reactors each, while the rest would be suitable for one.

In February 2008 British Energy (BE) was talking to more than 10 possible partners about building new reactors.²⁶ But in March the Government dropped a commitment to holding a minimum 29.9% stake in BE,²⁷ thus triggering a takeover battle for the whole company.²⁸ By July EdF, in partnership with Centrica, were the only remaining bidders, but the BE Board rejected their bid on 31st July. Then in September 2008 the £12.5 bn takeover of BE by EdF was finally approved.²⁹

The Government has said it doesn't want a single owner of the best sites for new reactors³⁰ and will not tolerate a single monopoly player.³¹ EDF wants to build four giant 1.6 gigawatts reactors using the French EPR design on two sites currently owned by British Energy: Hinkley Point in Somerset and Sizewell in Suffolk.³² EDF has promised to sell off unwanted land at other British Energy sites so that rival power companies can develop new reactors at Bradwell, Essex, and either Heysham, Lancashire, or Dungeness, Kent.³³ However, EDF has angered other utilities by insisting on a clause in the BE purchase agreement which gives it the right to block the sale of any of these sites until 2011, or until it has gained planning consent for its two preferred options.³⁴

EdF had already bought land adjacent to the Wylfa site on the island of Anglesey, owned by the NDA, which may have given it the option to build a new reactor there if it hadn't succeeded in buying BE.³⁵ Now the NDA and EDF have agreed to the simultaneous marketing of their land interests at Wylfa in order to secure a better price for the land. The simultaneous marketing agreement sets out that this sale process shall take place as soon as practicable and anticipates that the NDA's land at Oldbury and Bradwell will be sold concurrently.³⁶

NDA sites

Meanwhile, utilities were asked to express an interest in a range of potential locations by the NDA. The NDA has 18 sites in the UK, including Sellafield and the Magnox sites.³⁷ Potential

²⁶ Herald 14th Feb 2008.

http://www.theherald.co.uk/business/news/display.var.2042893.0.British_Energy_surges_on_positive_reaction.php

²⁷ FT 7th March 2008 <http://www.ft.com/cms/s/0/87540e3e-ebd1-11dc-9493-0000779fd2ac.html>

²⁸ FT 15th March 2008

<http://www.ft.com/cms/s/0/1029181a-f1fb-11dc-9b45-0000779fd2ac.html>

²⁹ Guardian 25th September 2008

<http://www.guardian.co.uk/business/2008/sep/25/edf.britishenergygroup>

³⁰ Times 22nd February 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article3412912.ece

³¹ Observer 23rd March 2008

<http://www.guardian.co.uk/business/2008/mar/23/britishenergygroupbusiness.nuclearpower>

³² Times 25th September 2008.

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4821330.ece

³³ Guardian 25th September 2008

<http://www.guardian.co.uk/business/2008/sep/25/edf.britishenergygroup>

³⁴ Times 26th September 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4828094.ece

³⁵ City AM 16th June 2008 <http://www.cityam.com/index.php?news=15524>

³⁶ NDA Press Release 24th September 2008. <http://www.nda.gov.uk/news/edf-agreement.cfm>

³⁷ Sunday Times 2nd March 2008.

http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article3465259.ece

buyers were given four weeks to respond from 6th March 2008.³⁸ RWE and Energy Solutions are among those to have expressed an interest. The NDA said it would select three sites that have proven most popular among potential buyers and then decide on the nature of a sale process.³⁹ Then in September it announced it would sell land adjacent to Bradwell in Essex, Oldbury in Gloucestershire and Wylfa on Anglesey by a competitive process.⁴⁰

Energy Solutions, the nuclear services company based in Salt Lake City, Utah, which is running the Magnox sites on behalf of the NDA, is working on a plan to build and operate a new nuclear reactor at Wylfa with Toshiba-Westinghouse, the Japanese-owner of the AP1000 reactor design. They have held talks with several European and British utilities companies about forming a separate new-build consortium to one involving British Energy.⁴¹ The consortium is also interested in building reactors at Oldbury and Bradwell,⁴² and has offered to accelerate the UK's stalled nuclear clean-up programme – in return for being given the sites to build a new fleet of reactors.⁴³ Eon has applied to National Grid for a connection that would allow it to build a 1,600 mega-watt reactor at Oldbury by April 2020.⁴⁴

Other sites

There have been constant rumours about non-nuclear sites being considered, although these are usually denied. *The Times* reported that E.on is considering nominating two non-nuclear sites in Kent as potential locations for new reactors⁴⁵ – the Isle of Grain, near Sheerness, and Kingsnorth, near Ashford. If they are nominated, BERR would assess the sites and open a public consultation on a draft list next spring.⁴⁶

The Jackson Consulting report on nuclear siting revealed that some of the 14 coal fired power station sites may potentially be available for new nuclear build. In many cases these conventional power station sites are likely to already have water and grid facilities. And if no other existing sites are available then it may be possible to build a nuclear power station at a completely new location. In the 1980s CEBG identified seven greenfield sites in the UK that might potentially be suitable for new nuclear.

The suggestion that coal-fired power station sites might be used for new reactors was particularly controversial in Oxfordshire, home to the Didcot power station.⁴⁷ The

³⁸ BERR Press Release 6th March 2008

<http://nds.coi.gov.uk/Content/Detail.asp?ReleaseID=358129&NewsAreaID=2>

³⁹ Reuters 9th June 2008

<http://uk.reuters.com/article/mergersNews/idUKL095949920080609?rpc=401&&pageNumber=1&virtualBrandChannel=0>

⁴⁰ NDA Press Release 10th September 2008. <http://www.nda.gov.uk/news/land-sale.cfm>

⁴¹ Times 14th April 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article3739257.ece

⁴² Times 28th April 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article3827898.ece

⁴³ Observer 1st June 2008

<http://www.guardian.co.uk/business/2008/jun/01/utilities.britishenergygroupbusiness>

⁴⁴ Times 11th September 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4727457.ece

⁴⁵ Kent News 20th May 2008 <http://www.kentnews.co.uk/kent-news/No-nuclear-plans-for-Hoo-Peninsula--says-E-ON-newsinkent13069.aspx?news=local>

⁴⁶ Times 20th May 2008

http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article3964832.ece

⁴⁷ Telegraph 25th May 2007

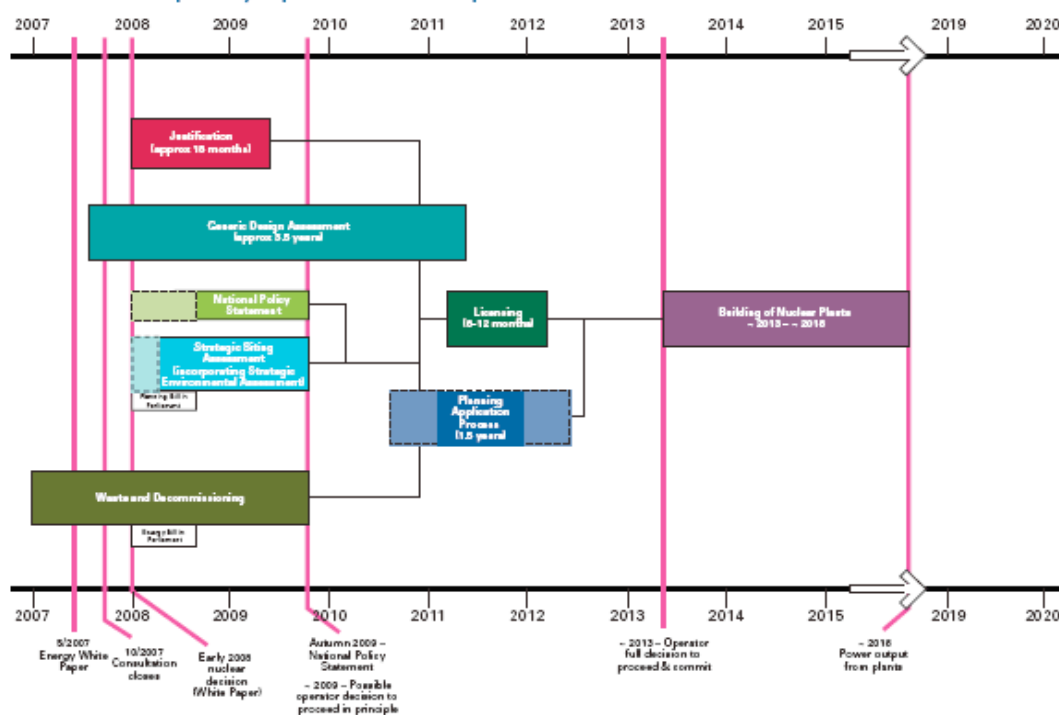
<http://www.telegraph.co.uk/news/main.jhtml;jsessionid=HJCLTRMP3MIR5QFIQMFSFFOAVCBQ01V0?xml=/news/2007/05/25/nuke125.xml>

Oxfordshire press reported that both Didcot and Harwell had emerged as potential sites.⁴⁸ RWE npower, which owns Didcot Power Station, said it had no intention of going nuclear, or selling the site when Didcot closes in 2015.⁴⁹

Flooding

The Jackson report also warned that tens of millions of pounds may have to be spent on flood defences and sea walls.⁵⁰ Any reactors built in low coastal areas would need protection from rising sea levels and storm surges, the study said. Extra spending on defences would add to the huge cost of construction. Recent studies by the Met Office⁵¹ & Middlesex University confirm this.⁵²

Chart 1: Indicative pathway to possible new nuclear power stations



Timetable taken from the Nuclear White Paper. The Timetable for the Strategic Siting Assessment already seems to have slipped.

Pete Roche

⁴⁸ Oxford Mail 24th May 2007

http://www.oxfordmail.net/display.var.1423564.0.county_could_get_nuclear_station.php

Didcot Herald 24th May 2007

http://www.heraldseries.net/news/hsdidcotnews/display.var.1423490.0.nuclear_power_station_could_be_built_in_county.php

⁴⁹ Oxford Mail 30th May 2007

http://www.oxfordmail.net/display.var.1436522.0.power_plant_rejects_nuclear_future.php

⁵⁰ New Scientist 23rd May 2007 <http://www.newscientist.com/article/dn11913-uk-backs-new-generation-of-nuclearreactors.html>

⁵¹ Review of medium to long term coastal risks associated with British Energy sites: Climate Change Effects. M. Gallani, Met Office for British Energy, 22 Feb 2007

http://british-energy.com/documents/energyEnvironment/BE_2006_siteclimate_v1.12_final.pdf

⁵² The impacts of climate change on nuclear power stations sites. Middlesex University Flood Hazard Research Centre, 12 Mar 2007 <http://www.greenpeace.org.uk/media/reports/the-impacts-of-climate-change-on-nuclear-power-station-sites>