



# Newsletter September 2008

## Top consultant to speak on risks of new reactors

Monday 13<sup>th</sup> October, 7.30pm, British Legion Club, Castle St, Bridgwater

(Edited) text kindly provided by Nuclear Consultant John Large for our newsletter:

**John Large will give an illustrated presentation that provides an up to date prediction of the radiological consequences of a severely damaging incident at Hinkley Point, this being the first time since 1982 that a revised radiological impact assessment for PWR has been publicly aired. The following describes some of John's points:**

### **Hinkley C & D**

Based on EdF's undertaking that two European Pressurised Reactors (EPRs), will be commissioned at Hinkley Point, the radiological health consequences of these larger nuclear plants will be analysed taking into account upwards revisions to the causal factors linking radiation dose to health detriment, the larger core mass of nuclear fuel, the increased irradiation or burn-up of uranium fuel rendering it more radiotoxic, and the impact of MOX (plutonium) fuelling, all in account of the lessons learnt from Chernobyl.

The modelling and analysis will draw upon the outcome of highly confidential terrorist attack exercises carried out on nuclear plants in the United States, it will assume the same capabilities of the terrorist to penetrate the security at Hinkley Point, seek out the vulnerabilities of the nuclear plant, and to contrive effective means by which a radioactive release will take place. For the radioactive dispersion and

consequences the European standard COSYMA software has been deployed, together with NOAA satellite data to provide real time imaging of the dispersion and radioactive fall-out in the aftermath of the release.

The analysis and projections for Hinkley Point will be expressed in terms of the risk of any one individual sustaining health harm in the aftermath of a radioactive release and, related to the increased health risk from the larger EPR plant operating with a greater extent of irradiation (burn-up) and/or with a plutonium based fuel core, the need to extend both the range and resources allocated to the local authority off-site plan (under the Radiation (Emergency Preparedness and Public Information) Regulations 2000)

### **Background**

The present operational nuclear power station at Hinkley Point B comprises two Advanced Gas-Cooled Reactors (AGR) but plans announced (24 September 2008) by EdF at its takeover of the present Hinkley operator British Energy, suggest that of the 4 European Pressurised Reactor (EPR) nuclear plants that it has planned for the UK, two will be built alongside the existing nuclear plants at Hinkley Point, with the other two at Sizewell, Suffolk.. The first EPR is planned to be in electricity generation by 2017 so, with the expected retirement of the fault ridden and troubled

existing Hinkley AGRs within a few years, the spare electricity distribution grid capacity from Hinkley strongly favour this first EPR being commissioned at Hinkley Point.

Compared to the AGR reactors, each of 600MWe capacity, the EPR is rated at about 1,600MW<sub>e</sub> generating capacity. With a projected operational life of 60 to 65 years, the EPR nuclear plant is capable of utilizing uranium based nuclear fuel to much higher irradiation (burn-up) levels and also of being fuelled with plutonium based fuel (MOX).

### **Official projections**

In 1982 the then National Radiological Protection Board (NRPB but now part of the Health Protection Agency) published the results of its comprehensive analysis into a radiological incident at the proposed Sizewell B pressurised water reactor (PWR) nuclear power station. For this analysis it was assumed that a severely damaging incident would rupture the reactor containment dome (*containment failure*) giving rise to a very significant release of radioactivity into the environment, yielding a maximum of 2,600 (130 probabilistic expected value) or so deaths in the short term and around 31,000 (3,300 expected) deaths in the longer term.

This projection of health detriment assumed that countermeasures would be judiciously implemented, including the speedy evacuation of about 300,000 (24,000 expected) members of public from the locality around the Sizewell site. However, for its mortality and morbidity projections the NRPB relied upon the then ICRP 26 standard that is now superseded by the universally adopted ICRP 60 recommending a x4 increase in the causal effect of radiation exposure, so much so that the 1982 analysis is now considered to be an *under-estimate* of the potential consequences of such a release.

### **Post-Chernobyl changes**

The next projection for the radiological consequences of a PWR reactor accident

carried out in the UK was in 1988 for the PWR nuclear plant proposed at Hinkley Point in Somerset. For this study, obviously in account of the Chernobyl disaster two years earlier, the damage and worse case incident considered to be credible comprised a very limited release of radioactivity with the reactor containment remaining intact throughout and following the incident, thereby constraining the radioactive release to a *containment bypass* for which no early or longer-term deaths were projected.

For the EPR the designer, AREVA, reckon that the nuclear plant is entirely protected from accidents and malicious acts that could result in significant release of radioactivity. In making this claim AREVA place extraordinary reliance on its failsafe engineered systems and containment, so much so that, in the very worst and most severe incident, the release would be limited to just 0.03% of the reactor fuel radioactive inventory. Put another way, over the six days following the explosion at the Chernobyl Unit N<sup>o</sup> 4 reactor, it is reliably estimated that at least 30% of the total reactor fission product radioactivity released uncontrolled into the atmosphere. The equivalent worst case reactor incident release from an operational EPR at Hinkley Point would, according to AREVA, result in no more than (6 x 0.03%=) 0.18% of the radioactive inventory.

*John Large is the Chief Executive of Large & Associates, a company of consulting engineers based in London that specialises in the nuclear field. He is a Chartered Engineer, a Fellow of the Institution of Mechanical Engineers, a Graduate Member of the Institution of Civil Engineers, a Member of the British Nuclear Energy Society and a Fellow of the Royal Society of Arts. From the 1960s to the 1990s, he undertook full time research for the United Kingdom Atomic Energy Authority (UKAEA) on reactor systems.*

## Consultation meetings

**Our public meeting is timed to occur just before a series of meetings organised by British Energy on the siting of new reactors at Hinkley (see Events).** Please consider attending this rare chance to hear John's insider expertise and then perhaps voice your concerns at one of the Hinkley meetings.

The relevant Government department (DBERR) has stipulated that nuclear operators must consult with the local public as part of their national consultation on the factors for deciding on new nuclear sites.

They have listed some criteria as either 'exclusionary' or 'discretionary' to assess whether any particular site should go forward to the next stage and be considered for local consideration by the Infrastructure planning Commission. The IPC replaces the previous Public Inquiry such as the Hinkley C inquiry in 1988-89.

The criteria are as follows:

### **Exclusionary:**

Seismic

Capable of geological faulting

Demographics

### **Discretionary:**

Flooding

Tsunami, storm surge coastal processes

Proximity to hazardous industrial facilities

Proximity to civil aircraft movements

Sites of ecological importance

Areas of amenity, cultural heritage, landscape value

Size of site to accommodate construction, operation and decommissioning

Access to suitable sources of cooling

**Both:** Proximity to military activities

Stop Hinkley supporters who feel they could make points on these issues are urged to write to DBERR with their views. Please ask for the 'Strategic Siting Assessment' consultation document by contacting: 0845 015 0010 (local rate) or emailing a request to: [ssacriteria@berr.gsi.gov.uk](mailto:ssacriteria@berr.gsi.gov.uk)

You can also download the consultation papers at: <http://www.berr.gov.uk/consultations/page47143.html>

Closing date for responses is November 11<sup>th</sup>.

DBERR hopes to announce the new criterion at the end of the year, inviting potential operators or builders to officially nominate specific sites next year. The decided sites are expected to be announced in 2010.

## Design Assessment

**Readers will know that the UK Nuclear Installation Inspectorate (NII) is engaged in a process to license new reactor designs which are all foreign.**

The Generic Design Assessment process is expected to take three and a half years, after which the new planning process will kick-in and operators can apply to build a licensed reactor at a designated site.

Two designs have been withdrawn from the four starters: CANDU, a Canadian design and General Electric-Hitachi just two weeks ago. This leaves just the Westinghouse AP1000 reactor at 1000 MW and the AREVA EPR a 1600 MW reactor, discussed above.

German utility E.ON has shown interest in building an EPR at Oldbury, where Westinghouse has also expressed interest. E.ON has already agreed a 1600 MW connection with National Grid for the Gloucestershire site.

## Contacts

**Jim Duffy**, Coordinator, newsletter editor:  
68 Birchwood Ave, Wallington, SM6 7EN  
0208 395 6191, [stophinkley@aol.com](mailto:stophinkley@aol.com)

**Val Davey**, Membership, treasurer,  
website manager: 01460 240241,  
[val@stophinkley.org](mailto:val@stophinkley.org)

**Website:** [www.stophinkley.org](http://www.stophinkley.org)

## **New study shows 50% excess breast cancer in Burnham**

**A new study of breast cancer registrations in Burnham North and South shows a 50 percent excess above national figures.**

The eleven year study by Professor Chris Busby uses data obtained since a landmark House of Lords ruling in July that allowed 'incidence' data to be made available to independent researchers. Previously just 'mortality' data was available. Incidence data is more helpful in defining environmental links to health effects.

Stop Hinkley applied straight away for the new statistics which the South West Public Health Observatory was now required to supply under the Freedom of Information Act. We asked Prof (formerly Dr) Busby to analyse the figures.

Over the eleven year period 1994 to 2004 113 women would have been expected to contract breast cancer. In fact 167 women were diagnosed: a rate fifty percent higher than normal. The

statistical chance of this occurrence over the two wards is one in 200,000. The statistics allow for any age differences from the norm.

The alarming figures back up several previous studies by Prof Busby including last year's infant mortality study, highlighted on BBC West, that found a three-fold excess in estuary wards near Hinkley, including Burnham.

Earlier studies from 2000 onwards have shown excess of breast cancer mortality (Busby) and incidence (PCAH and SW Cancer Intelligence Service). SWCIS has always denied the link to Hinkley Point.

Three Somerset Health Authority studies in 1983, 85 and 87 showed excess child leukaemia in wards near Hinkley but did not look at Burnham. A German government-sponsored study this year found a doubling of leukemia in children living up to 5 kilometres from nuclear power stations with an observable effect up to 10 kilometres (6 miles) (Kaatch).

Chris Busby made the headlines in **New Scientist** (9<sup>th</sup> September) with a joint study showing uranium to be much more radioactive than thought due to its absorption of gamma rays.

### **Events**

**John Large public meeting 13<sup>th</sup> October – see poster**

#### **Stop Hinkley meeting**

7.30pm Tuesday 14<sup>th</sup> October, West Bow House  
Turn right after the Squib pub on West Street, Bridgwater

#### **British Energy meetings: 'Hinkley New Build?'**

All start at 6.30pm:

Oct 15 Victoria Hall, **Stogursey**

Oct 16 Princess Hall, **Burnham-on-Sea**

Oct 20 St. Mary's Church Centre, **Nether Stowey**

Oct 21 Bridgwater College (new name), **Cannington**

Oct 28 Bridgwater and Albion RFC, **Bridgwater**

Oct 29 Otterhampton Village Hall, **Combwich**

To register for the British Energy meetings, and be kept in touch with developments, you're asked to email [mail@hinkleynewbuild.co.uk](mailto:mail@hinkleynewbuild.co.uk) or phone 0800 980 3195.