



# Newsletter

## November 2008

### Top consultant's concerns over EPR safety

**“The bigger the reactor the more advanced the fuel, the smaller the release fraction tolerable” John Large**

In October top nuclear consultant John Large gave an illustrated presentation in Bridgwater providing an up to date prediction of the radiological consequences of a severely damaging incident at Hinkley Point.

This was the first time since 1982 that a revised radiological impact assessment for a Pressurised Water Reactor (PWR) had been publicly aired.

The present operational nuclear power station at Hinkley Point B comprises two Advanced Gas-Cooled Reactors (AGR).

But plans announced by EdF at its takeover of the present Hinkley operator British Energy, suggest that of the four 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.

#### **Hinkley site favoured**

The first EPR is planned to be generating 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 favours this first EPR being commissioned at Hinkley Point.

#### **High burn-up fuel or MOX**

Compared to the AGR reactors, each of 600MW capacity, the EPR is rated at about 1,600MW 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 or 'burn-up' levels and also of being fuelled with plutonium based fuel known as MOX.

#### **Earlier predictions**

In 1982 the then National Radiological Protection Board (NRPB), now part of the Health Protection Agency published the results of its comprehensive analysis into a radiological incident at the proposed Sizewell B PWR nuclear power station.

For this analysis it was assumed that a severely damaging incident would rupture the reactor containment dome, an event known as containment failure, giving rise to a very significant release of radioactivity into the environment. This would produce 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 four times 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.

### **Hinkley B predictions**

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.

### **European Pressurised Reactor**

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 days x 0.03% =) 0.18% of the radioactive inventory.

### **Buncefield and Chernobyl**

John used the Buncefield oil disaster to demonstrate the process of industrial scale fires describing three stages:

1. Puff – high lift into the atmosphere
2. Fire & dispersion with fallout – this is sensitive to weather and terrain
3. Thermal drift phase – a 'lazy' plume perhaps lasting for days and also giving fallout.

With a computer generated model he showed a hypothetical fire at Hinkley on a random date of 1<sup>st</sup> October, with a plume over Bridgwater in thirty minutes reaching the Isle of Wight in five hours, then drifting over Normandy and Brittany.

Extrapolating the wind directions from the Chernobyl accident to Hinkley, the plume drifted first towards Devon before changing direction to Wales and then on to Iceland and Scandinavia.

### **Some quotes from John Large:**

"The challenge for the French is the ability to engineer the containment and fuel to release *less* into the environment during the course of an accident than from a previous reactor."

"Sizewell B with 110 tonnes of fuel will produce 30,000 units of radioactivity; The EPR with 130 tonnes would produce 60,000 units."

"Reactor designs haven't had the time to adjust to terrorism."

"The 2.4 kilometre Hinkley Emergency Planning Zone can be extended to ten kilometres. There's a thirty kilometre zone around Chernobyl: no-one lives there now. Three million people live in 'sanitary zones' in Ukraine alone."

*The paper that John Large gave has been edited for this newsletter. Together with his Powerpoint slides it is viewable in full on his website at:*

<http://www.largeassociates.com/Hinkley/Hinkley%20-%20October-final-summary.pdf>

## Nuclear plant concern for residents

Western Morning News, Wednesday,  
October 01, 2008

MORE than half of people living close to nuclear plants, such as Hinkley in Somerset, still have concerns over threats to security and health, a report has revealed.

Researchers from Cardiff University and the University of East Anglia said almost two-fifths (38 per cent) of local residents accepted their nearby power station "reluctantly", but 16 per cent were opposed outright to it.

One of the main criticisms from locals has been the lack of consultation over potential nuclear power plant schemes. The researchers found 54 per cent of those questioned worried about the risks of living within 10 miles of a power station.

The results are a warning to the Government against assuming strong local support for new-build power stations on existing sites – thought to be the only places where it is likely the plants will be able to be given the go-ahead.

More than half of those questioned – 61 per cent – near Hinkley Point, Somerset, and half of those questioned near Oldbury, Gloucestershire, were in favour of new-builds on their local site. But the survey of 1,326 residents found almost a quarter at Hinkley Point and almost a third near Oldbury opposed a new power station.

Professor Nick Pidgeon, of Cardiff University, said the study showed locals tended to support new-builds in their area, but said: "There is a significant proportion which showed conditional support and their acceptance is potentially quite fragile, while a minority are opposed and are highly distrustful of industry and Government."

He said the Government and industry needed to be honest and start consulting

now if there were sites under consideration if support was to be maintained.

The revelations have been welcomed by the campaign group Stop Hinkley (and Shut Oldbury). Group spokesman, Jim Duffy said: "I think the industry might have hoped for better results than this. There seems to be a big chunk of nominally supportive local people who have mixed feelings and, when reminded of the risks, tend to shy from nuclear.

"Professor Pidgeon reveals that over the five-year study, local people have demanded 'consultation in a proper manner', but the Government has already failed on this point with its rigged 2006 Energy Review, which buried the low figures for nuclear's usefulness towards climate change at the back of its bogus consultation. We're still waiting for the results of Greenpeace's complaint to the ombudsman."

The five-year study of the area around three nuclear power sites found about a third of residents believed the local plant brought benefits and had high levels of trust in local operators.

Some 38 per cent were ambivalent, but accepted it because of concerns over climate change and energy security, 16 per cent were opposed to it and 12 per cent felt there was no point worrying about it.

The in-depth interviews revealed terrorism and health were the most common concerns.

Professor Pidgeon said: "Any erosion of local confidence could have adverse consequences for relations between the nuclear industry and local communities... This clearly argues against complacency about the future. Engagement should start early. I would say to the government get on with it."

*Editor: The Greenpeace complaint to the ombudsman over the bias in the Government's repeated consultation was successful: see overleaf.*

## Consultation for nuclear power 'biased'

**Evening Standard, 18<sup>th</sup> October 2008**

GORDON Brown's drive to nuclear power was dealt a blow today when another consultation was branded biased by a watchdog.

Members of the public were given loaded presentations which could have given a falsely high level of support for planned new nuclear generators.

The work was carried out by the market research firm founded by Mr Brown's personal pollster, Deborah Mattinson, a long-standing Labour Party adviser.

It is the second time the process has run into difficulties. In 2006, a High Court ruling found the Government's process had been unlawful as it had failed to engage in the fullest consultation.

In part of the latest, the public were given slide shows and information packs. But Greenpeace protested the packs were partly written by the Government and that questions to stimulate debate were loaded.

It was backed by the industry watchdog, the Market Research Standards Board, which said the exercise broke part of its code calling for "reasonable steps to ensure that respondents are not led towards a particular answer".

It said in a ruling: "There were a number of examples where ... objectively viewed, information was inaccurately or misleadingly presented, or was imbalanced." The Government insisted the consultation was valid as the section criticised amounted to a single day's event.

## British Energy/EDF meetings

Campaigners attended the BE and EDF local meetings and exhibitions about new build at Hinkley, distributing leaflets at some. EDF announced their intention to build two reactors with just a one year gap between starting each. About fifty percent of a full meeting at Nether Stowey was critical of the plans, whilst most people attending the Burnham exhibition were opposed, many on health grounds. Cannington residents were concerned about traffic and other local issues.

## Oldbury

German power company, E.ON has begun buying farmland next to the existing power station. Oldbury owners, the Nuclear Decommissioning Authority, want to sell a share of their land for new build but also want to extend the life of the decrepit 40 year old reactors by two years. The safety regulators have forced one or other of the two reactors to remain shut over the last five years so it would be inexplicable if they give it a licence.

## Events

**Stop Hinkley Meeting**  
**7.30pm Tuesday 13<sup>th</sup> January**  
**West Bow House**  
**Turn right after the Squib pub on West Street, Bridgwater**

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