

Allan Jeffery's talk on Radioactive Waste on 19 March 2015

1.

(Good evening, my name is Allan Jeffery, I am one of several assistant co-ordinators of the Stop Hinkley Campaign.)

The first slide reminds us that Radioactive Nuclear Waste is a worldwide problem for the nuclear industry.

Tonight though, I want us to consider how Radioactive Nuclear Waste affects us all here in Somerset, now and into our children's, childrens's future.

2.

In Somerset we have 2 nuclear power plants, Hinkley- A and Hinkley- B, looking across the Severn Estuary to Wales.

Both are old British designs of gas cooled reactors, built and paid for by the British taxpayers.

On the left, the two blue buildings are HINKLEY- A. One of the early Magnox design, which generated electricity from 1965, on and off for about 35 years and was forced to close in the year 2000 for safety reasons. Now the government's National Decommissioning Authority has started the long process of trying to de-commission the station.

On the right, the large pale building is HINKLEY-B. This is an example of the second generation of British nuclear reactors, is still working on a life extension.

It's planned generating life has already been extended by EDF and the government. This reactor is showing signs of its old age, as the graphite core is cracking up. Safety factors will limit further life extensions.

3.

And now our government wants to build 2 of the most powerful reactors in the world as HINKLEY-C, on the site next to the old reactors.

These are a French Design called the EPR (European Pressurised Water Reactor), this is water cooled, one of the new third generation reactors. This is supposedly more fuel efficient and claims to be a much safer design. But these features have made them the most expensive in the world and virtually un-constructable, suffering long construction delays and huge building cost increases.

Despite 4 of these reactors being under construction over 10 years around the world, none are yet generating.

4.

All Nuclear Reactors, whether they are in Submarines, or power plants, during the fission process turn the Uranium fuel into 2 main products-

1. HEAT ENERGY –

used to boil water to make steam, to spin turbines and generators to make electricity. Two thirds of this heat energy is thrown away and wasted into the Severn Estuary.

And less talked about

2.RADIOACTIVE WASTE –

This is the resulting mixture of radioactive ISOTOPES produced after splitting the Uranium atoms.

These are toxic and harmful to all living things as they give off IONISING RADIATION which must be kept out of our air, water and food.

5.

This slide shows where IONISING RADIATION entering our bodies can cause long term health damage.

A copy of this slide can be found on the seats around you.

6.

The Nuclear Radioactive Waste produced in Somerset's reactors take 3 key forms, - all of which need to be dealt with safely!

1. Is the SPENT URANIUM FUEL.

Uranium fuel is removed from the reactors when it is no longer efficient and replaced with new fuel. Spent Fuel is highly radioactive and hot.

2. RADIOACTIVELY CONTAMINATED MATERIALS- these are anything that has become radioactive during the fission process, and includes clothing, tools, filters, and the steel and concrete of the buildings themselves.

3. RADIOACTIVE GASES AND LIQUIDS – These low level gaseous and aqueous emissions are continually emitted from the working reactors into the air and Severn Estuary, adding to the background radiation levels.

The next speaker will deal with these in a lot more detail.

7.

The Government puts Radioactive Waste into 3 levels:

1. HIGH LEVEL ACTIVE WASTE

This gives off high levels of dangerous radioactivity and is very hot, and needs to be continuously cooled in either wet or dry storage facilities.

In Britain we store high level waste almost entirely in water filled cooling ponds vulnerable to terrorists.

This deteriorating 60 year old cooling pond ,at Sellafield, exposed in the media last year caused much public concern.

8.

In the U.S.A. and parts of Europe high active radioactive waste is stored in dry storage as shown here and is air cooled.

At Suffolk where we have our only Pressurised Water Reactor, they have run out of space in the cooling ponds and are building some necessary extra dry storage facilities on site.

9.

2. INTERMEDIATE LEVEL WASTE

This also gives off dangerous levels of radiation, but does not give off heat. It still has to be securely packaged for long periods of time, this slide shows some intermediate level waste, sealed in cement or grout in a barrel.

10.

LOW LEVEL WASTE

Contaminated materials giving off much lower levels of radiation, which decay in relatively short periods of time are treated in several ways. Some are incinerated or dissolved in liquids and diluted and dispersed into the environment. Some are tightly packed into containers and stored in waste compounds. The government is causing us concern by wanting to store some of our ever increasing volumes of low level radioactive waste at public landfill sites.

11.

So what happens to waste from Hinkley –A and Hinkley-B?

During their working lives the A and B station's spent fuel is stored for 90 days in cooling ponds until it is safe enough to be packaged in cooled, concrete, transport flasks.

Here you can see the fuel in the cooling ponds below the B station.

12.

These flasks are taken to Bridgwater by lorry, here you can see a transporter with the old style flask in Roseberry Avenue, behind Bridgwater Station.

13.

At Bridgwater Station this hazardous waste is loaded by crane onto railway trucks , within 100 metres of Eastover Primary school. They are then reversed into the main station exposing the public to Gamma radiation as they stand on the platform, before starting their journey up to Sellafield in Cumbria.

14.

Here we see the spent fuel flasks, passing through Bristol on their long journey north to Sellafield in Cumbria for reprocessing.

All the fuel was removed over several years from the A station after it closed, but regular train journeys still continue each week carrying the spent fuel from the B station.

It's worth remembering that during the Olympic Games movements of trains carrying nuclear waste through London were cancelled for the period of the games, because of fears about possible terrorist attacks.

15.

This is the final destination of the spent fuel from the A and B stations, the cooling ponds at Sellafield. These provide long term storage before reprocessing, to separate the Plutonium, Uranium and high active waste.

16.

As Hinkley A is being decommissioned the National Decommissioning Authority is trying to reduce the volumes of intermediate waste to be packaged in these yellow cast iron boxes in a temporary waste store on site. Presently Magnox are considering much cheaper concrete storage containers.

17.

Eventually the Intermediate Level Waste at Hinkley A will be stored in a special waste store similar to this one at Oldbury.

18.

Hinkley's Solid Low Level Radioactive Waste is packaged and sent by train to the National store at Drigg in Cumbria.

This site is on the coast and the Environment Agency is concerned that the rising sea levels will mean that coastal erosion of this site is possible within a hundred years!

19.

Dealing with the Radioactive Waste at Hinkley Point C is a totally different kettle of fish to the legacy waste from the A and B stations.

Because the EPR uses fuel twice as enriched, and kept for twice as long in the reactors, the spent fuel is much hotter and much more dangerous to handle and package than the legacy fuel from the A and B stations.

This fuel will have to be cooled and kept safe at Hinkley initially for 10 years of cooling, and then stored on site for at least 100 years in these cooling ponds less than 50 meters from the sea. Compare this with the 90 days of cooling of the A and B station spent fuel which is shipped up to Sellafield to become Cumbria's long term problem.

Somerset will become the high level Radioactive waste store, the Sellafield of the South West.

20.

Here you can see clearly the two high level waste store buildings, a short distance from the sea wall.

21.

The government calls this 'temporary storage' until a national geological disposal facility is built.

Basically a deep hole in the ground to hide away the nation's high and intermediate level radioactive waste. Out of site!

No GDF for storing radioactive waste safely for thousands of years has been built anywhere in the world and where would one be built in the UK?

The government has been planning this for over 60 years and is still no closer to siting and building one!

22.

Is Hinkley a sensible place to build a permanent radioactive waste store?

Climate change is causing increasing extreme stormy weather and rising sea levels.

The Severn Estuary is the second highest tidal range in the world

Hinkley point is vulnerable to tidal flooding and coastal erosion

23.

This slide shows the combined tidal and river flooding of the Hinkley site, in 1981, the A and B stations have become an island, and the flooding cuts right across the access routes to where they want to build the Hinkley C reactors.

24.

Stop Hinkley believe that Radioactive waste sums up all the problems of nuclear electricity.

The more we use nuclear reactors the more radioactive waste we produce.

Nuclear waste pollutes the living environment and is a threat to us and future generations.

The costs of keeping nuclear waste safe and secure are an ever increasing financial burden for us and our children's children.

We must stop producing more nuclear radioactive waste, It is not safe, cheap or necessary.

25.

Radioactive Nuclear Waste – Stop Making It!