



# Newsletter December 2018

## Lessons for Hinkley from Sellafield

Stop Hinkley press release, 15 November

On the morning after the Financial Times has called on the UK Government to reassess its long-term energy plans following the demise of Toshiba's Moorside nuclear project, the Stop Hinkley Campaign has published a briefing about lessons we can learn from the Sellafield Thermal Oxide Reprocessing Plant which is in the process of closing after only 24 years of operation and a very chequered performance.

The "Lessons for Hinkley from Sellafield" briefing says:

- The cost of building THORP increased from £300m in 1977 to £1.8bn on completion in 1992. With the additional cost of associated facilities this figure rose to £2.8bn.
- Originally expected to reprocess 7,000 tonnes of spent fuel in its first ten years, it has managed only around 9,300 in 24 years.
- The original rationale for THORP ended with the closure of the UK's fast reactor programme in 1994.
- The new rationale – to produce plutonium fuel for ordinary reactors - was a disaster costing the taxpayer £2.2bn.

Stop Hinkley Spokesperson Roy Pumfrey said: "The rationale for building the THORP plant at Sellafield had disappeared before it even opened. The lesson for 2018 is that we should scrap Hinkley C now before costs escalate. The cancellation costs are small relative to the £50billion extra we'll have to pay for Hinkley's electricity, if it ever generates any. If we wait any longer to scrap it, we risk heading for another Sellafield-scale financial disaster."

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**Stop Hinkley Briefing  
Lessons for Hinkley from Sellafield  
by Pete Roche and Rachel Western**

<http://stophinkley.org/WManDecom/HinkleyTHORP.pdf>

**MERRY CHRISTMAS**

## Toshiba's UK withdrawal puts Cumbria nuclear plant in doubt

BBC News, 8 November

"After considering the additional costs entailed in continuing to operate NuGen, Toshiba recognises that the economically rational decision is to withdraw from the UK nuclear power plant construction project, and has resolved to take steps to wind-up NuGen," the Toshiba statement said.

Korea Electric Power Corporation (Kepeco) had been a preferred bidder to take over the nuclear power plant project, but those talks fell through after more than a year of negotiations.

- Nuclear archive wins best building award
- Government must 'get a grip' on Sellafield
- Job cuts at firm behind new nuclear plant

Toshiba said it expected to take a 15bn yen (\$131.8m; £100.5m) hit from the withdrawal, but shares in the firm jumped 12.7% in Tokyo.

The GMB union said the "looming collapse" of Moorside had been "depressingly predictable".

"Relying in this way on foreign companies for our country's essential energy needs was always irresponsible," said its national officer Justin Bowden.

"A new nuclear power station in West Cumbria remains vital for the UK's future energy security and requires urgent action."

In September NuGen announced it was reducing its team at Moorside from more than 100 to fewer than 40 - leading to speculation the plant's development was in jeopardy.

NuGen was initially co-owned by Toshiba and the French firm Engie. Toshiba was subsequently forced to buy the remaining 40% of NuGen it did not already own via a bankruptcy condition related to Engie.

## The real cost of nuclear and why it is so expensive

Financial Times, 18 November

How much does a nuclear plant cost? Take Britain's Hinkley Point in Somerset, currently under construction with a completion date pencilled in for some time in the late 2020s. The headline figure that is usually given?

Somewhere in the region of £20bn. But that is just for construction; it is not the whole picture. Remember you do not get a penny of revenue till the plant is up and running. That means financing those construction costs for up to 10 years, during which the debt is compounding away like rabbits.

Then you have decades when you are steadily servicing and paying down those loans. The cost of financing is so dominant that it can account for almost half of the costs of the project, according to the economist Dieter Helm.

Which leads to a key conclusion: that if you want to constrain spending, do not just focus on the price of pressure vessels, labour or concrete. No, it is the cost of capital that you really have to drive down. Looked at through the project's life, the cost of financing alone is roughly four times the amount needed to build the thing. The fundamental difficulty with nuclear is there is simply no rational economic way to know how much, if any, to build. Driven by the UK's climate commitments, it is essentially an insurance policy against no technology emerging that produces zero-carbon, reliable power much more cheaply. The opportunity cost is substantial.

After all, each project ties large chunks of capacity to nuclear for decades to come. If nuclear is to have any place in the mix it must be at the lowest cost. Ideally the state would finance the construction of these assets as it could suppress returns the furthest. (The government has toyed with this at another project in Wales). The so-called RAB model is far from perfect. But if more reactors are to be constructed, their capital costs must fall dramatically. The UK cannot afford more nuclear if it comes at Hinkley rates.

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## Getting customers to pay for new nuclear upfront

Financial Times 21st November

EDF is pushing a plan to finance nuclear investment in Britain that it claims would cut the cost of power from new reactors to levels competitive with gas and renewable energy. The French state-backed power utility wants to use a technique commonly used in utilities such as water, airports and power distribution. This allows

companies to charge customers upfront for new infrastructure. It is being used in the £4.2bn project to build a "super sewer" under London's river Thames.

But the mechanism has never been tried for a project as technically complicated and lengthy as a nuclear power station, which can take a decade to build. This and other challenges mean any gains are not assured. With capital-intensive, long-life assets such as sewers and power transmission networks, financing represents a substantial chunk of the overall cost that needs to be recovered. Charging upfront reduces this by avoiding the need to roll up interest during the construction phase, thus cutting the amount of compounded debt to be serviced and paid off during the life of the asset.

"Given that financing alone represents roughly two-thirds of the lifetime costs of building and operating a nuclear power station, it is actually a much better deal for consumers," said Humphrey Cadoux Hudson, managing director of nuclear development at EDF Energy, the group's UK subsidiary. "They get to buy electricity at far cheaper cost." EdeF's proposal comes at a time when Britain's much touted nuclear renaissance is in danger of shorting out. The first deal - which will see the French group and its Chinese partners build a £20bn station at Hinkley Point in Somerset - was struck in 2016 at a guaranteed strike price of £92.50 per megawatt hour (MWh) in 2012 prices, indexed for 35 years and worth about £105 in current terms. Heavily criticised for being excessive, it was at least similar in headline terms to the prices required for renewables, nuclear's main zero carbon competitor.

However, renewable costs have since fallen sharply, with some deals for offshore wind farms being signed for as little as £55-60 per MWh with 15 year contracts. These are not strictly comparable; renewables generate intermittent power that requires costly back-up whereas nuclear produces consistent base load electricity. But observers agree the price gap presents a problem. Concerns about the attractiveness of nuclear investment in the UK were highlighted earlier this month, when Toshiba of Japan chose to liquidate its investment in the Moorside site in Cumbria rather than continue, having been unable to secure a buyer for the scheme.

The government has been forced to consider a direct equity injection into another project, at Wylfa in Wales, to keep that scheme on track.



## New delay in start-up of Finnish EPR

Researched and written by World Nuclear News,  
29 November

The start of regular electricity generation at the Olkiluoto 3 (OL3) EPR has been pushed back by a further four months and is now expected to begin in January 2020, Finnish utility Teollisuuden Voima Oyj (TVO) announced today.

Last month, the plant's supplier - the Areva-Siemens consortium - announced it wanted to update the schedule for completing the unit as commissioning tests were taking longer than planned.

TVO said it has been informed by the Areva-Siemens consortium that fuel will now be loaded into the reactor core in June 2019, with grid connection to take place next October, and the start of regular electricity generation scheduled for January 2020.

Under the previous schedule provided by the plant supplier in June this year, fuel loading was expected in January 2019, grid connection in May and the start of regular electricity production in September.

Hot functional testing of the 1600 MWe pressurised water reactor began last December and was completed in late May, 50 days later than planned. These key pre-operational tests ensure coolant circuits and nuclear safety systems are functioning properly before fuel is loaded. They are the first tests at plant-level where the reactor and turbine plant are operated as a whole, although still without fuel.

The delay in completing the hot functional tests was due to vibrations in pressuriser surge line. Based on the test results, TVO said a comprehensive modification package would be implemented at OL3 to update the plant's electrical and instrumentation and control systems.

TVO has now said the commissioning tests of OL3 will take longer than expected and are still ongoing. "The final automation modification package will be implemented and the pressuriser surge line vibrations will be repaired by modifying the pipe support, and the commissioning test will be continued," the company said. "After modifications, the necessary commissioning tests will be repeated and commissioning will continue."

According to the commissioning programme, OL3 will generate 2-4 TWh of electricity with varying power levels during the test programme, which will begin at grid connection and end when regular electricity production starts.

"Although this new delay is disappointing of course, it is important that the whole

commissioning is performed with utmost care, without compromise," said TVO's OL3 Project Director Jouni Silvennoinen. "We will have a modern and safe plant, and we are already looking forward to the operating phase."

The Areva-Siemens consortium began construction of Olkiluoto 3 - the first-of-a-kind EPR - in 2005 under a turnkey contract signed with TVO in late 2003. Completion of the reactor was originally scheduled for 2009, but the project has suffered various delays and setbacks.

On 29 June, Taishan 1 became the world's first EPR to achieve grid connection and power generation. It is expected to enter commercial operation later this year. Taishan 2 - which is in the equipment installation phase - is scheduled to begin operating next year.

Construction of the Flamanville EPR began in December 2007, with commercial operation originally expected in 2013. Hot functional tests are now expected to begin before the end 2018. The loading of fuel into the unit's core is expected in late-2019.

Two further EPRs are planned for the Hinkley Point C plant in Somerset, England.

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### Stop Hinkley are very sorry to learn of the death of John Large.

Jim Duffy, Stop Hinkley Co-ordinator 1999-2010, remembers him:

John, a nuclear engineer who helped develop the AGR reactors at Harwell, was pivotal in shutting down Hinkley 'A' in May 2000. On TV and in



public meetings he exposed the danger from corrosion in its inlet pipes which could lead to a nuclear fire. BNFL shut the plant years before scheduled. He gave talks in

Bridgwater to back up our campaign, and more recently in the BBC Inside Out program where I explained our local worries about the dangers of the cracks in the Hinkley B station graphite core. He gave detailed reasons in the program about the dangerous risks of continuing to run with the damaged graphite core.

John's character and valuable knowledge will be missed by us all. Our sincere condolences to his partner and family.

Obituary:

<https://www.theguardian.com/environment/2018/nov/14/john-large-obituary>

# Closure urged after 350 cracks found in nuclear reactor

The Ferret Website, 21 November

More than 350 cracks have been discovered in an ageing nuclear power reactor at Hunterston in North Ayrshire, breaching an agreed safety limit and prompting calls for a permanent shutdown.

Experts have warned that the cracks could lead to a “catastrophic accident” releasing clouds of radioactive contamination over Glasgow and Edinburgh. But Hunterston’s operator, EDF Energy, insisted that the reactor was safe – and is bidding to relax safety standards so that it can be restarted.

Reactor 3 at Hunterston B nuclear power station originally started generating electricity in 1976, and is the oldest in the UK run by EDF. It has been closed down since 9 March 2018 so that its graphite core could be inspected for cracks.

The reactor was initially due to restart on 30 March, but the date has been repeatedly postponed as more cracks have been found. EDF is now hoping for permission from the UK government’s Office for Nuclear Regulation (ONR) to fire up the reactor on 18 December.

Now we can report that more than 350 cracks have been discovered in reactor 3. According to ONR, 350 is the “operational limit” in the safety case that determines whether or not the reactor is allowed to operate.

EDF has told the local Hunterston Site Stakeholder Group that it was likely to propose to ONR that reactor 3 in future be permitted to run with up to 1,000 cracks. EDF has also closed down the adjacent reactor 4 at Hunterston to check for cracks, but hopes to reopen it on 30 November.

Whether or not ONR allows Hunterston reactor 3 to restart, and under what conditions, will have major implications for the life of EDF’s other nuclear power station in Scotland at Torness in East Lothian. It will also impact five EDF nuclear plants in England.

The 3,000 graphite blocks that make up the cores of advanced gas-cooled reactors such as those at Hunterston B and Torness are vital to nuclear safety. Their integrity enables the reactors to be cooled and safely shut down in an emergency.

But bombardment by intense radiation over decades stresses the blocks, producing cracks at the base of key slots known as “keyway root cracks”. If enough of the blocks fail, experts say, nuclear fuel could overheat, melt down and leak radioactivity in a major accident.

The independent nuclear engineer John Large has previously argued that Hunterston reactor 3 should be permanent shut down. Before he died

on 3 November he was helping radioactivity consultant, Dr Ian Fairlie, prepare a presentation on Hunterston.

Fairlie, a former adviser to the UK Department for Environment, Food and Rural Affairs, shared Large’s concerns. “I worked closely with John Large in the weeks before his untimely death,” he told The Ferret.

Large was concerned about the cracking causing graphite blocks to split, making the system of interlocking blocks in the reactor core less stable. “As a result, any untoward event such as a steam surge, sudden outage or earth tremor could result in a serious accident – a large release of radioactive gases,” Fairlie said. “If other safety systems failed at the same time, there could be a catastrophic accident – such as occurred at Chernobyl in 1986 in the former USSR. John was adamant that the Hunterston reactors should therefore not be restarted.”

News that 350 keyway root cracks have now been found meant that over 10 per cent of reactor 3’s blocks had split, according to Fairlie. He said that EDF’s computer modelling had failed to predict such a high level of cracking.

He added: “EDF does not have a good handle on the ageing mechanisms inside the reactor. This means that reactor 3 should definitely not be restarted.”

Fairlie presented his findings to a recent meeting in Kilmarnock of the Scottish group of Nuclear-Free Local Authorities (NFLA). The group is intending to write to ONR’s chief nuclear inspector seeking a meeting, and to alert politicians at Holyrood.

“The analysis provided by Dr Ian Fairlie over increasing keyway root cracking of the Hunterston B reactors is of real concern,” said NFLA Scotland convenor and Glasgow SNP councillor, Feargal Dalton.

The increasing number of cracks was “particularly worrying”, he added. “It is absolutely critical that nuclear safety considerations are dealt with real care, and it is a concern that EDF’s computer modelling appears to not be giving them enough information on the wider safety and integrity of the reactor’s graphite core.”

Rita Holmes, chair of the Hunterston Site Stakeholder Group, accused EDF’s experts of getting their predictions wrong. “If safety were indeed EDF’s number one priority, then reactor 3 would remain shut down,” she argued.

“As it is EDF is seeking permission to restart an aged reactor, which despite huge efforts and high cost, failed to back up its current safety case. The



Hunterston keyway root cracking was not predicted to be so progressed.”

Holmes questioned whether a new safety case allowing far more cracks would be any more reliable. “There’s a lot at stake if the experts are wrong again,” she said.

ONR confirmed how many cracks had been found. “A conservative assessment of the inspection results shows that the number of cracks in reactor 3 exceeded the operational limit of 350 cracks in the existing safety case,” said an ONR spokesperson.

“However, it should be noted that the safety case demonstrates a significant margin beyond this limit and safe operation was ensured.”

ONR declined to speculate about what it would decide on restarting the reactor. “We understand that EDF Energy is currently working on a revised safety case to justify a return to service of reactor 3,” said the spokesperson.

“Once we have received the safety case from EDF we will fully assess it and permission will only be granted for the reactor to return to service if we are satisfied that it is safe to do so. This assessment will include consideration of the timing of further inspections

EDF Energy stressed that nuclear safety was its overriding priority. “We have carried out the most extensive inspection programme on an advanced gas-cooled reactor station to date at Hunterston B,” said a company spokeswoman.

“During the most recent inspection of reactor three we examined around a quarter of the core. As expected we identified a number of new cracks. This number exceeded the operational limit of the existing safety case but was significantly mitigated by the cracks being much narrower than modelled in the safety case.”

She added: “The most recent results support the work we are doing on the long-term safety case and underline our confidence that the normal operations at the station are unaffected and that there would be safe shutdown in the event of a one in 10,000 year earthquake.

“We are preparing to present a safety case for return to service of reactor 3 to the regulator, ONR, for their assessment. We have also carried out similar inspections on reactor 4 and the case for return to service for that unit is currently with the ONR for review.”

The Scottish Government emphasised the need for tough safety standards, but highlighted Scotland’s dependence on nuclear electricity. “It is essential the strictest environmental, safety and security requirements are met at all nuclear installations,” said a government spokesperson.

“We are aware of the situation at Hunterston B and are in regular contact with EDF, ONR and local stakeholders in the neighboring communities. Although ONR is not directly accountable to the Scottish Government, we expect it to ensure the nuclear industry maintains the highest standard.”

The Scottish Government also stated that it was opposed to new nuclear stations “under current technologies”. But it pointed out that Hunterston B and Torness currently made a “significant contribution”, accounting for over 40 per cent of electricity generated in Scotland in 2016.

“Our continued opposition to new nuclear generation does not preclude extending the operating life of Scotland’s existing nuclear stations provided that strict environmental and safety criteria are met,” the government said.

“Scottish Ministers recognise that prolonging the lives of these stations will help to maintain security of supply in Scotland over the next decade while the transition to renewables and cleaner thermal generation takes place.”

**Update:** On 22 November 2018, Reuters reported that EDF Energy had further delayed the scheduled dates for reopening Hunterston reactors 3 and 4.

Read more: <https://theferret.scot/350-cracks-hunterston-nuclear-reactor/>

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## Email contact

If you would like to receive the newsletter more quickly, in addition to other information, please let us have your email address by contacting [val@stophinkley.org](mailto:val@stophinkley.org). We can still send the newsletter by ‘snail mail’ as well if you prefer.

If you are already receiving the newsletter by email and don’t need the postal version any more, please let Val know.

The newsletter will still be sent out with the renewal reminders each year.

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## Roll out the Radioactive Waste Barrels for April 2019

We at Stop Hinkley have committed to a day of surround action next year 27th April 2019 at Springfields, the nuclear fuel production installation near Preston in Lancashire, as we are an active part of the Stop New Nuclear protest. See attached flier.

We are keen to have at least 100 radioactive waste barrels coming together to represent the 100,000 years of hazardous waste legacy we are leaving for future generations to deal with.



Our last big day of action at Hinkley Point was a few years ago and we feel the need to make our voices heard again in a very visual and powerful protest and to join all the other campaign groups across the country in solidarity with their protests too.

We are keen that other groups take part, which is simple to do. Make some radioactive waste barrels and pledge to bring them to Springfields. We felt that barrels, making their way from many corners of the country, would be symbolic of the radioactive waste story. Each group can publicise the event in a statement in their own area. Springfields is where the nuclear fuel is made for the whole sorrowful nuclear business.

Material and parts for making the barrels have already been bought and prepared in kit form. We are 'rolling out' barrel making workshops around the country over the winter, the perfect time for a sewing project, and building positive energy to launch the next stage of each of our campaigns in the Spring next year.

Do get in touch at [springaction2019@stopnewnuclear.org.uk](mailto:springaction2019@stopnewnuclear.org.uk) We will help you set up a workshop. All you need in preparation is a group of willing people and a place to work. It's an opportunity for those people who don't usually have the chance to actively contribute to get out their sewing machines and lead the way! There are people in the Stop New Nuclear group willing to travel to lead the workshop as we have done quite a few of these already and they are a fun day to do.



We are very grateful to OOA Fonden for their generous donation of £1,000 towards our campaign.



OOA Fonden is a Danish entity established by the Danish movement against nuclear power. OOA (Organisationen til Oplysning om Atomkraft) means Organisation for Information on Nuclear Power.

The primary purpose of OOA Fonden is to manage the rights of the OOA on a non-profit basis, especially related to the Smiling Sun logo, expressing the message NUCLEAR POWER? – NO THANKS in any language. OOA Fonden distributes 2/3 of any license income to regional and international activities serving the anti nuclear movement.

Read the history of the logo here: [http://smilingsun.org/page\\_2.html](http://smilingsun.org/page_2.html)

Buy Smiling Sun stickers, etc., here: <http://smilingsun.org/>

## Events

**Stop Hinkley meetings**  
**Mondays 21 Jan & 18 Feb at 7pm**  
**West Bow House, Milton Place**  
**Off West Street, Bridgwater TA6 7RT**

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