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## Hinkley Point C and Sea-level rise

### Introduction

In 2007, a report for Greenpeace by the Middlesex Flood Hazard Research Centre took as the basis for its worst-case scenario the collapse of the West Antarctic Ice Sheet (WAIS), which would trigger an abrupt and extreme rise in sea level, estimated at 5-6m. The report pointed out that there are widely divergent opinions on the likelihood of this extreme sea-level rise but one view is that WAIS collapse could begin in the 21st century.

The report concluded that:

*“...given that the cliff line in this area is currently subject to erosion, and that the rate of erosion may increase over the life and decommissioning of a new power station, the reality is that **the site is not a feasible option**. Building on a new site, would simply transfer the challenges facing the current station along the shoreline and extend them over a longer time frame.” [Emphasis added].*

### Hinkley Seawall

Hinkley Point C will have a 900m long seawall of crest height 13.50m Above Ordnance Datum (AOD) (height relative to average sea-level) with an integrated footpath set at 12.40m AOD. The Hinkley Point C Stress Test report as described by the ONR gives a flood height diagram, showing the extreme flooding level of 9.52m AOD (with no waves) and the site platform at 14m AOD.

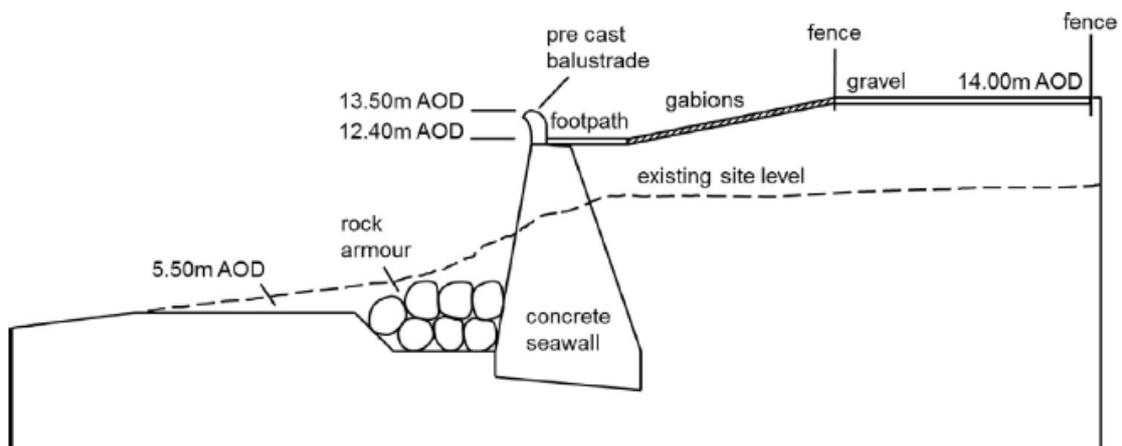


Fig. 17. Section through the proposed seawall at Hinkley C power station.

Taking into consideration “wave effects” of 2m this gives a margin of 2.68m for the site though a little less than 2m before over-topping of the wall would occur. This is deemed to be sufficient as the site is a small distance inland of the seawall.

EDF commented that natural hazards including all combinations of tides, storm surges, tsunamis and possible sea level rise due to climate change have been taken into consideration. (1)

In 2012 an assessment, carried out by the Department of Environment, Food and Rural Affairs, of the risk of flooding and storm surges for the UK’s nuclear sites showed that Hinkley Point would have a high risk of flooding and erosion by 2080. (2) At that time the Office for Nuclear Regulation confirmed the “fundamental safety” of Britain’s nuclear plants. A spokeswoman said. *“Protection from flooding has also been factored into our new-build plans and will be covered by a robust regulatory regime, should consent be granted.”*

However, that was before the increasing volume of melting of the Greenland ice cap was properly understood and when most experts thought there was no net melting in the Antarctic.

Now estimates of sea level rise in the next 50 years have gone up from less than 30cm to more than a metre, well within the operating lifespan of Hinkley Point C – let alone the period before final decommissioning of the reactors, and the period when spent nuclear fuel is likely to be stored on site. The Government is hoping that the length of time spent fuel will need to be stored after the end of power station operation can be reduced to 60 years, but that is still 127 years from now.(3)

Some researchers say sea levels could rise by six metres or more even if the 2 degree target of the Paris accord is met. Sustained warming of one to two degrees in the past has been accompanied by substantial reductions of the Greenland and Antarctic ice sheets and sea level rises of at least six metres – several metres higher than what current climate models predict could occur by 2100. (4)

Another group of researchers suggested that if global warming continued at its present rate it could start a process in Antarctica which would lead ultimately to an additional sea level rise of 2.9 metres. This latest study suggests that rapid melting in Antarctica could begin within the next century. (5) The Antarctic ice sheet contains enough ice to raise sea level by approximately 57 metres (187 feet), about half the length of a soccer pitch. (6)

While it is unlikely that enough ice would melt to raise sea-levels by 57 metres, Antarctica is so massive that just a small fraction of this ice melting would be enough to cause huge problems for people and infrastructure on the coast. Satellite data suggests that Antarctica is now causing sea levels to rise at a rate of 0.6mm a year – faster now than at any time in the past 25 years. The rate at which ice losses from Antarctica will increase in response to a warming world remains uncertain. (7)

Meanwhile, the Greenland Ice Sheet has the potential to raise sea levels by 7 metres. (8)

Even if the world’s nations keep their promise to contain global warming to within 2°C, past warming shows that the Earth will still change visibly – and perhaps sooner than science currently expects. Sea levels could rise by six metres. Large tracts of the polar ice caps could collapse.

A six metre rise in sea levels fuelled by the thermal expansion of the oceans and the loss of the world’s glaciers, and the retreat of the Greenland and Antarctic ice caps, could take thousands of years, but the rate of change is uncertain. And once such changes begin it would be very difficult to halt or reverse them. (9)

Do we really want to be building new nuclear facilities and waste stores which are likely to still be there in 125 years, on the coast when there is so much uncertainty?

- (1) A.Raby,etal.,Implicationsofthe2011GreatEastJapanTsunamionseadefencedesign,InternationalJournal of DisasterRiskReduction(2015), <http://dx.doi.org/10.1016/j.ijdrr.2015.08.009i>
- (2) Guardian 7th March 2012 <https://www.theguardian.com/environment/2012/mar/07/uk-nuclear-risk-flooding> [The unpublished Government Analysis is available here <https://www.scribd.com/document/84289220/Nuclear-sites> ]
- (3) Geological Disposal - Feasibility studies exploring options for storage, transport and disposal of spent fuel from potential new nuclear power stations (NDA/RWMD/060/Rev1), RWM January 2014 <https://rwm.nda.gov.uk/publication/geological-disposal-feasibility-studies-exploring-options-for-storage-transport-and-disposal-of-spent-fuel-from-potential-new-nuclear-power-stations/>
- (4) Guardian 6th July 2018 <https://www.theguardian.com/environment/2018/jul/06/global-temperature-rises-could-be-double-those-predicted-by-climate-modelling>
- (5) Climate News Network 21<sup>st</sup> May 2016 <https://climatenewsnetwork.net/antarctic-glacier-melt-raise-sea-level-3m/>
- (6) Climate News Network 21<sup>st</sup> June 2018 <https://climatenewsnetwork.net/antarctic-buffer-damage-spurs-ice-break-up/>
- (7) Independent 21<sup>st</sup> June 2018 <https://www.independent.co.uk/environment/antarctica-ice-glaciers-weather-sea-levels-global-warming-a8403996.html>
- (8) Inside Science 14th June 2018 <https://www.bbc.co.uk/programmes/b0b5qng9>
- (9) Climate News Network 10th July 2018 <https://climatenewsnetwork.net/past-warming-shows-2c-brink-may-be-close/>