Response to PINS questions on Cooling water and ecology RR-0792 Sizewell C project

PINS personal reference 20025871

Originally related to response to my PINS representation
https://infrastructure.planninginspectorate.gov.uk/projects/eastern/the-sizewell-c-project/?ipcsection=relreps&relrep=41144

COOLING WATER SYSTEM.

Sea temperatures and monitoring.

There appears to be a fundamental problem with all information related to fisheries and the wider marine environment, whereby CEFAS who are an acknowledged expert body (sponsored by DEFRA) are engaged by EDF NNB Genco to advise them.

Having previously pointed out to BEIS officers this potential conflict of interest and the perceived difficulty for an organisation reliant on Government and outside income, which maybe needs to decide where its priorities lie. As witness this statement from CEFAS made recently, captured from the link below :- "we avoid conflicts of interest by not providing advice to government regulators on new nuclear" .

Response to media coverage regarding Cefas' Sizewell C advisory work - Cefas (Centre for Environment, Fisheries and Aquaculture Science)

The National Policy statements EN6 for nuclear are out of date. Who therefore are the correct body to advise government and regulators on matters relating to the marine environment and specifically fish?

CEFAS facilitate the website, and have control of, the UK wide Wavenet monitoring system. http://wavenet.cefas.co.uk/Map set up to monitor temperature and other sea water data. The Sizewell NPS has a dedicated monitoring station number 10 deployed since 1967 with public records available until 2013.

https://www.cefas.co.uk/data-and-publications/sea-temperature-and-salinity-trends/results/station-10-sizewell-ps/

The fact that information is on public record up to 2013 and then ceased to be updated, may be coincidental, but it would appear to have coincided with the start of EDF consultations. Regardless of this there is an upward trend of the temperature of the seawater off Sizewell indicated in those available records. Nuclear power plants have a safe upper limit on the intake cooling water, usually around 26 degrees centigrade, above which the reactor has to be shut down. This shutdown occurs regularly in France during heatwaves with some NPS which have river based cooling water systems.

The presence of 3 operating reactors in the locality of Sizewell could have an impact on plant availability or efficiency at times of hot weather. Efficiency and output of the plant is already (marginally) reduced as cooling water temperature rises.

Around 2013 much environmental data was removed from easy public access. Previously the Environment Agency had a "what's in your backyard website" allowing investigation into local pollution sources in a readily accessible manner.

The Hinkley NPS. Wavenet service has been withdrawn and is no longer available. CEFAS have advised me that this may be reintroduced.

In order to understand trends and impacts on the marine environment it appears evident that reliable data must be available, specifically for sites of concern including NPS. I am also advised that there is a major dispute about fish mortality and impacts on fish stocks and breeding patterns.

The outfall is also an all too convenient route for liquids disposal to the marine environment of radioactive and industrial chemicals, treated sewage and possible viruses and bacteria. There are no Blue Flag beaches in the locality of Sizewell. The local authority withdrew bathing water monitoring for cost reasons. The length of the outfall and the potential addition of chlorine to reduce biofouling may also contribute to species mortality.

I understand that the temperature increase to the marine environment from one reactor of 12 degrees C could have wide major impacts. The combined impact from two reactors could be even more widespread and at greater volume and velocity.

Damage to Fish stocks and the marine environment.

Having been aware for many years that fish were killed by entrapment in the cooling systems at Sizewell A and B I feel this concern is understated by industries which use direct water cooling. I fully support TASC paper on fish stocks prepared by their expert adviser who I believe has disproved the CEFAS evidence and claims there is far greater mortality of fish.

When my submission was made in October 2020 I was aware that there was a problem with the EDF (NNB Genco) request to vary the permit conditions at Hinkley Point C for the discharge of turbine condenser cooling water and process waters into the Severn Estuary by removing the Acoustic Fish deterrence system. The planning inquiry process is scheduled to take place between 8th and 21st June. EDF permit variation request is contested by a large number of conservation and angling interests.

It may be pertinent to suggest that PINS arrange for an observer to be present at that enquiry in order to hear evidence first-hand.

There is also an ongoing dispute about the disposal of dredging material from the HPC CW system into the marine environment, based on concerns about the prospect of radionuclides present in the mud from previous nuclear operations at Hinkley A and B. TASC held a meeting to hear from Professor Tim Deere-Jones the potential health impacts of aerosol dispersion of radionuclides from dredging and operational nuclear power stations. I support the work of Prof.Tim Deere-Jones. I do not know if this is an issue at Sizewell.

Removal of the Acoustic Fish deterrence system is believed to have an impact on wildlife and could irreparably damage fish stocks, breeding species and birds, like the red throated diver, which feed on those fish. However an acoustic fish deterrence system could also potentially damage or disrupt protected marine mammals like the harbour porpoise.

The following comment has been endorsed by Whale and Dolphin Conservation “Acoustic deterrent devices do not directly harm dolphins, but they introduce an additional noise into the marine environment which in combination with all the other noise might affect dolphins. If deterrent devices deter porpoise and dolphins from areas that are important feeding grounds, especially porpoises who have high metabolic requirements and basically need to feed constantly, may be unable to compensate energetically and suffer negative long-term fitness consequences.”

Direct cooling water system and alternatives.

The Generic Design Assessment (GDA) for the EPR reactor prepared by the Environment Agency (and ONR) cautions on the design of intake system for the EPR. geho0510bsjz-e-e.pdf (publishing.service.gov.uk)

The GDA outlines a requirement for 67 cu metres per second per reactor. 134 cu metres for two reactors, equivalent to a combined total of 30,000 gallons per second, or a staggering 4.2 billion cu metres per annum. By comparison the River Tweed one of the UKs largest river systems has a normal flow rate of 78 cu metres sec. The possible impact on coastal process from the Cooling

system, particularly if it is combined, is acknowledged in the Royal Haskoning/British Energy Scoping Report 2008 for Sizewell C*, yet the mortality of fish and potential damage to the marine environment appears to be downplayed. There is far more understanding now of the importance of protecting the oceans related to climate change, than when the scoping report was done in 2008.

The GDA also indicates a potential requirement for a desalination plant which would require 680,000 cu metres of sea water (unclear if this is per reactor) to help supply 331,600 cu metres per annum of freshwater. The town water supply for construction and operation is still not finalised for Sizewell C.

A potential further demand for town water for a local hydrogen plant being promoted by Ryse Hydrogen and EDF for SZB is noted. Yet how any water supply to that project will be provided, at the time of writing this report, is not known.

Terms like “low velocity entry” compared to this enormous flow rate do not seem to be credible. One can only surmise that any system operating at this flow rate and velocity is liable to be overloaded and could cause the reactor to be scrammed. This event is on record and generally was due to seaweed or jelly fish swarm and occurred at another EDF plant at Torness.

The alternative to Direct cooling could be Cooling Towers or recirculation through a “pond”. The only use of a “pond” in the UK at Trawsfyndd Magnox Nuclear Power station, I understand has resulted in contamination of the lake cooling water and the plant had to cease generation early.

The United States Environment Protection Agency issued rule 316B to protect rivers and seas effectively banning direct cooling for new projects. Existing power plants have to be re-permitted or additional measures taken to protect species. https://www.epa.gov/cooling-water-intakes?csModule=security/getfile&PageID=693859

Based on this US decision it may be reasonable to conclude that direct cooling is no longer **best available technique** for the UK. The Environment Agency studies were carried out in 2010. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291077/scho0610bsot-e-e.pdf

That study presumably was used to help advise the siting process for new nuclear policy EN6 in 2011. As noted above EN6 is out of date and due for review now. I believe the cooling system criteria for a revised EN6 needs urgent review.

Conclusion. The use of Direct cooling at Sizewell C could impact coastal process, fish and species mortality, damage the marine environment and be incapable of performing safely during adverse weather (heatwaves) whilst posing unknown/exceptional threats exacerbated by sea level rise and storminess over its 60 year lifetime. Potentially being completely unsustainable. There is no potential to use cooling towers at Sizewell without further major intrusion into the AONB. This Cooling Water issue alone should form a major objection to any consent for Sizewell C and I humbly submit should be considered for an issue specific item requiring expert knowledge which I am assured is available.

ECOLOGY

My comments are based on observations as a local resident and former Leiston cum Sizewell town councillor.

EN6 Sizewell C.8.52 and C.8.53. Impact on groundwater, connectivity, red data book species, purpose of AONB and designated sites.

Simply I do not believe that the claims made by the developer for a biodiversity net gain can be met.

As an indication why biodiversity net gain is difficult to corroborate, the full impact of all the development has been withheld and the final construction plans are not available at this time. This is

confirmed by Office of Nuclear Regulation in my FOI response FOI20210268 dated 9th April 2021 and also the size of the site has not been divulged on a grid referenced OS map (as requested by PINS)

This lack of detail does not allow the full ecological damage on the Sizewell Marshes SSSI to be readily assessed. Land that has taken millennia to evolve along with all its eco systems cannot be replicated. The Aldhurst farm habitat restoration site failed to replicate fen meadow classification. River creatures which rely on light for navigation will be disrupted due to the plan to pipe part of the Leiston river en route to the Minsmere Sluice. The cut off wall may disrupt the hydrology at both sea side and SSSI.

Aldhurst Farm site has failed so far to demonstrate that habitat can be replaced. The management of that site appears to conflict with the original concept ie replacing a SSSI which has limited access. The access arrangements appear to conflict with the original aims. There is also no properly approved connecting culvert linking with the SSSI, risking mortality of protected creatures by road kill.

The premature loss of Coronation Wood at Sizewell, following approval of plans by a district council in 2019, as part of the relocation of Sizewell B buildings, in advance of a final investment decision on Sizewell C, by an unknown developer, has proven controversial and could have resulted in wildlife crime. I agree entirely with the views of Environmental specialist Mr. Tom Langton expressed at the open hearings.

A revised hybrid plan approved by the East Suffolk Council may result in further risk of harm to species by spoil dumping on part of the Sizewell C site, which is a known habitat for protected creatures. The planning process for both applications in my opinion (as a former district councillor myself), fell far short of standards and did not address the issue of spoil dumping and initially at the first planning meeting did not have Natural England approval. All of these consents were in advance of full impacts being taken into account during the proper PINS process. The SZB relocation was included in the DCO and in my opinion (and many others) should rightfully have been considered by PINS. PINS also must consider how the existing planning conditions for Sizewell B will be met including landscape features, planted woodland and flood protection mound. (This was referred to in our mail to PINS registered as a document 5-02-2021.)

A proposed second access road to the north of the site, (similar routes were originally not justified in evidence considered by Layfield at the Sizewell B Inquiry), will disrupt free movement of all species around the AONB particularly those on Sizewell Levels. The debate around the Layfield enquiry does makes interesting reading and PINS officers may wish to gain sight of those documents which are in hard copy. Damage and disturbance to the Benthills and beach habitat from machinery and chemicals introduced into the cooling system will potentially destroy rare shingle habitat. The construction of Sizewell C would also disrupt the feeding patterns, nesting and overwintering of protected species including red throated divers. (RSPB comments)

New roads and rail will also disrupt and fragment free passage and lose hedgerows and trees throughout the (enormously extended) construction site and beyond, including watercourses.

The Marsh harrier replacement foraging habitat appears to makes no sense especially the site in West Suffolk. Marsh Harriers may be placed at risk as a result of disturbance of nesting at Minsmere by the noise, light and pollution from any SZC, exacerbated by disrupting flight patterns and risking nest productivity by limiting access to prey species.

I note comments from other respondents regarding the lack of detail on the borrow pits which are in themselves a massive quarrying and waste disposal operation which normally would be subject to an extensive local Suffolk County Council Planning process including environmental impact assessments. A minerals and waste operation in an AONB would not normally be permitted.

Conclusion on ecology.

The multiple risk to many fragile diverse habitats and the ecology from this enormous 10-12 year project cannot I believe result in biodiversity net gain.

Please note:-

I have endeavoured to answer question RR- 0792 from a layperson perspective, the views expressed are meant for consideration on that basis and on information which I assume to be valid at this time.

Author. Mike Taylor 31st May 2021.

Thanks and references made to CEFAS, Prof.Tim Deere-Jones, TASC, Beyond Nuclear USA, Whale and Dolphin Conservation, Tom Langton, Environment Agency, Office of Nuclear Regulation.

*Royal Haskoning British Energy Scoping report 2008 unavailable on website search.