Together Against Sizewell C

Response from Together Against Sizewell C (TASC) regarding three new operational environmental permit applications for the proposed Sizewell C power station site, Sizewell, Suffolk, IP16 4UR

08 October 2022

Summary

The EA documentation opens with this announcement: 'Our proposed decision is that we should issue all 3 permits. Our Habitats Regulations Assessment conclusions support our view. We consider that the limits and conditions in the permits are suitable to protect people and the environment.'

TASC contest this statement. The following text demonstrates that the EA has no grounds upon which to base such a conclusion and it is therefore our view that all three permits should be denied.

In essence, TASC is of the view that the EA has an obligation to justify the statement it makes in support of its proposed decision in a manner which acknowledges and accepts the uncertainties in respect of the health and environmental impact of radioactive and non-radioactive particulates, gases and liquids contained in the discharges associated with the operation of a notional Sizewell C. This document covers general comments as well as more detailed observations in respect of both the Radioactive Substances Regulation (RSR) and Air Quality permit consultations. The detailed observations regarding the Water Discharge Activity permit consultation is dealt with under separate cover.

The uncertainties mentioned above – in particular those associated with radioactive discharges – have been subject to a downward trend in levels at which authorisations are set over the past few decades as information is gathered to cast doubt on the confidence with which regulatory limits are set. Despite these welcome reductions, there is growing evidence that the yardsticks historically used by regulators – 10^{-6} risk from a nuclear facility, the application of ALARP, BAT and other principles – have all been exposed as little more than mantras, predicated on the need to placate public fears and to pander to operators' budgets. There is still a growing and undeniable concern that exposure to a range of environmental contaminants which are routinely discharged to the environment are having health and environmental impacts about which we have much to learn. We note from the 2020 RIFE report that there is a discrepancy in CS137 levels at Minsmere Sluice and what appears to be excess beta radiation levels from a notional Sizewell site now. We also note that radiation tests carried out by the developer in July 2022 under Marine Licence MLA/2019/00029/4

results are not yet in the public domain. Baseline data around Sizewell site cannot therefore be relied on.

Sizewell C is not expected to be operational until at least 2035, probably later. In 12 or 15 years from now, we will have better evidence on which to base our knowledge and management of environmental contaminants. Authorised levels of discharge are likely to be further reduced. This renders your consultation on discharges from all sources redundant.

The EA will be aware as they are also members of BEIS/NGO forum that TASC and other NGOs have raised concern about the potential conflict of interest of CEFAS being paid for advising the developer and the inapplicability of the Regulators Code to the work of agencies including the EA when public health and their environment is concerned.

EA Executive Summary

This states:-

'Prior to public consultation on our proposed decision and draft permit, we are satisfied that the radiation dose rates to the public and wildlife associated with permitted discharges from the Sizewell C site would be well below:

• the UK's statutory radiation dose limit for members of the public of 1,000 microsieverts a year (µSv/y)

• the source (300µSv a year) and site (500µSv a year) dose constraints

• below our guideline level for non-human species of 40 micro Gray an hour (µGy/hour)

We have assessed the total dose to the representative person from discharges of radioactive waste and direct radiation from the proposed Sizewell C station as 4.7µSv a year. We have also assessed the total dose to a representative person from both past and future discharges of radioactive waste from all 3 Sizewell stations (A, B and C sites) at the permit limits as 28µSv a year.'

The EA has a responsibility and an obligation to explain the methodology used to calculate these exposure rates and to justify its statements that those exposures – even if it can be satisfactorily demonstrated to be accurate and the methodology sound – are 'safe'.

EA asks for responses to the following questions:

1. **General considerations and Operator competence**

Being part of EDF France, a group which is over €40 billion in debt, it is manifestly clear that NNB GenCo cannot justify that it is competent as a successful nuclear operator, especially given that it is about to be wholly nationalised by the French government and in 2022 50% of the reactors it operates in France have been off-line with many undergoing potentially lengthy investigations for technical problems. In addition, there are no grounds for the EA to assume that NNB GenCo is competent to operate a twin EPR station as there is virtually no

operating experience from which to learn. The consultation documentation attempts to deal with issues of operator competence that were raised by interested parties in the initial consultation. This, however, appears to be more of a box-ticking exercise and places much reliance on the HPC situation. HPC is not operational, nor is the Flamanville EPR 'flagship project' and it has been clear from the developer's delays and cost overruns at HPC that the HPC project is far from an ideal example to justify granting permits for SZC e.g. blaming delays on 'difficult ground conditions' after a decade or more of planning, as well as EDF's attempt to renege on its prior agreement to fit acoustic fish deterrents on the cooling water intake. Just because permits were granted for HPC, it does not justify repeating the same mistakes for SZC. There are new matters that the EA do not appear to have taken into account, as set out below.

The EA have failed to acknowledge that NNB GenCo is still a partnership between the soon to be 100% French government owned EDF and CGN, a company under the control of the Chinese Communist Party (with CGN being blacklisted by the U.S.A. authorities). The EA are accepting that NNB GenCo are relying on learning from HPC but that development is a third owned by CGN so how reliable will that data be? With the ownership being under the control of foreign states, how can it be deemed to be an appropriate developer or operator for such a deemed critical infrastructure project. Reflecting on the implications of Russia's invasion of Ukraine, it also needs to be recognised that EDF have a very close business relationship with Rosatom, the Russian state's nuclear energy company, a relationship that EDF appear to be reluctant to relinquish despite the horrors that Russia have inflicted on Europe, in particular Russia's weaponization of Ukraine's nuclear power plants.

The only operational EPR is in China, is modified to meet the Chinese regulatory requirements and one of its twin reactors was off-line for a year due to faults. The consultation documentation includes correspondence from EDF that claims that the Taishan 1 problems have been investigated and understood, trying to convey that the matter will be sorted by changes to the fuel assemblies. However, this is misleading as it has been reported by both the ONR and EDF France in its financial reports, that the flow of coolants in the reactor may be a problem. EDF France stated in its 2021 Universal Registration Document on page 78 "*Furthermore, the inspections carried out on the assemblies and the inside of the vessel* ***also revealed a localised phenomenon between the assemblies and a component covering the core related to hydraulic exposure****. Studies are underway to determine arrangements to reduce interactions between the assemblies and the core barrel."* and page 116 *" In addition,* ***a phenomenon occurring between the assemblies and a component enclosing the core has been identified, which would be linked to hydraulic stresses.*** *Studies are underway on these phenomena and their potential impacts."* And the ONR confirmed in an email to NGO Stop Sizewell C "*Modifications to the fuel assemblies are proposed to address the fuel failures, clad corrosion and the "localised phenomena between the assemblies and a component covering the core related to hydraulic exposure" by making the fuel assemblies more resilient to the coolant flows (hydraulic stresses). In addition, work is ongoing to consider whether any changes to the reactor pressure vessel internals are needed to reduce the hydraulic stresses."*

Therefore, NNB GenCo cannot claim to have satisfactory construction, operational or decommissioning experience, EDF's holding company is effectively bankrupt, NNB GenCo is planning to build a potentially flawed reactor design and should not be seen as a proper developer for EA to afford the level of competence required for this huge development.

NNB GenCo have not and cannot demonstrate that they have sufficient financial resources ie that they meet the financial competence condition to 'carry out your operations and meet your permit conditions'. Recent reports indicate that EDF France are likely to have debts of €60 billion by the end of 2022 and are facing outgoings of billions more to meet France's newbuild programme.

Due to the national security implications of the SZC project, including the involvement of foreign governments (ref para 2.2.1 'Role of the Secretary of State' of the RSA consultation document), TASC consider that these permit applications should be referred to the Secretary of State.

2. **The use of the best available techniques for the management and disposal of radioactive waste.**

Best available techniques (BAT) – taking into account economic and social factors - essentially means 'what the developer is prepared to pay for'. Techniques are available to reduce discharges to virtually zero but the decision about deploying such techniques is subject to the arbitrary consideration of cost and the benefits of incurring that cost. On the one side is consideration of developer's profits and on the other is the deleterious impact the plant's operation will have on the environment and the health of people receiving the publicly distributed dose from a privately operated and profit driven company. The company wins out, of course.

Whatever the detriment is to the environment and to public health, the EA, which apparently 'protects and improves the environment', will err on the side of a level of BAT deployment which suits the commercial needs of the company. The tragedy of this situation is that the EA is unaware of what damage their permits licence the company to inflict on the public and the environment. Despite this absence of knowledge, the EA plans to permit NNB GenCo to operate two reactors which will cause massive and irreversible damage to the environment and to harm an unknown number of people in ways which range from terminal illness to genetic damage in future generations. These reactors will, among other things, be responsible for discharging to the commons of the environment, a huge number of radioactive particulates and other contaminants, the health impact of which is unknown or, at best, is under-estimated.

The separation between 'dose' and 'risk', for so long assumed to be linear, is now recognised as being anything but linear, yet we embark on a 'nuclear renaissance' with the apparent approval and connivance of regulators who ignore the inadequacies of the authorisations they administer. The EA will licence the operation of these plants which will impinge and kill hundreds of millions of fish, fish fry, fish eggs and other marine biota, cause the demand for potable water in the East Suffolk region to rise to an unsustainable level in this driest of

counties and to encroach on and destroy an area of outstanding natural environment and SSSI, SPAs and a RAMSAR site. How's that for protecting and improving the environment?

In terms of radioactive waste management, TASC is interested in the claim from NNB GenCo that it 'shall minimise the impacts on the environment and members of the public from radioactive waste that is discharged or disposed of to the environment.'

If NNB GenCo intends to 'minimise' impacts, it must be aware of what those impacts are in order to make such a claim. The EA should have the ability and desire to spell out these impacts so that the public can see the putative benefits of NNB GenCo's largess in minimising the amount of detriment ~~is~~ it intends to expose the public to in the pursuit of its profit-making goals so that the public can compare impact now against the minimising of impact post-operation. TASC suspect this could not be done due to the fact that neither the EA nor NNB GenCo has the faintest idea of what the impact of their operations is, such is the level of our environmental protection.

While TASC recognise that the regulation of on-site nuclear waste management is the responsibility of the Office of Nuclear Regulation, it points out that Nuclear Waste Management estimate the figure of 5,600 tonnes of spent nuclear fuel will be generated by the twin reactors over their expected 60 year life. It is entirely possible – likely even – that a geological disposal facility (GDF) will remain unavailable even after that lengthy, notional operational period. It will therefore be required to be stored on site, at Sizewell while the effects of accelerated climate change will render Sizewell an island.

TASC consider that the 5,600 tonnes of spent fuel that will remain on site for an indefinite period, pending a notional GDF being available to take EPR waste, represent a major risk to release of radioactive substances to the environment. This is so, because NNB GenCo have not demonstrated that the site can be kept safe from the impacts of climate change for the period that spent fuel is reasonably expected to remain on site. The safety case in the SZC DCO documentation presented to the Examining Authority (ExA) is based on the unjustifiable assumption that all the spent fuel will be removed from site and the site fully decommissioned by 2140. On this basis, the site's main flood defences, monitored through the Coastal Processes Monitoring and Mitigation Plan (CPMMP) are only proposed to exist to 2140 and the operating company, SZC Co, is due to be dissolved by 2140 (see section 10 on page 75 of the CPMMP which states '*Within ten years prior to the end of decommissioning (presently anticipated to be 2140), SZC Co. must submit a monitoring and mitigation cessation report to the discharging authority or authorities for their approval. This report is necessary as* ***Sizewell C Co. will cease to exist at the end of decommissioning, as will this CPMMP*** [emphasis added]*, but it does not necessarily equate to the end of monitoring and mitigation…')*. Other information available shows that 2140 is not an appropriate date, including:-

i) The'*ONR/Environment Agency Joint Advice, Principles for Flood and Coastal Erosion Risk Management (ONR, Environment Agency and Natural Resources Wales, July 2017).'* states in Appendix A on page 11, *'Full life-time of the station [should be represented by] – operational life, plus the time taken for the*

decommissioning and interim storage of spent fuel and waste, prior to disposal. Again, this should be specified and justified by the operator, ***but is generally understood to be 160 years*** [emphasis added]." The same document on page 12 states *'... PINS should be satisfied that the applicant is able to demonstrate suitable flood risk mitigation measures. These mitigation measures should take account of the potential effects of climate change in the most recent marine and coastal flood projections. Applicants should demonstrate that future adaptation/flood mitigation would be achievable at the site, after any power station is built, to allow for any future credible predictions that might arise during the life of the station and the interim spent fuel stores."*

ii) The DCO application at para 7.7.92 [APP-192] indicates: *"Nuclear Industry Association (NIA) has concluded that the spent fuel from the UK EPRTM could be suitable for disposal 55 years following the end of generation. It is therefore assumed that the date for start of transfer of spent fuel from the Sizewell C site to a Geological Disposal Facility is 55 years after the end of generation. The process of transfer from the site will take approximately eight and a half years. On completion of transfer of the spent fuel from site, the Interim Spent Fuel Store (ISFS) would be decommissioned."* The Applicant advises in paragraph 5.1.5 of DCO document [APP-189] that it is assumed the ISFS would take 5 years to be decommissioned.

Combining these timetables together you arrive at a minimum timeline after operations cease of 55 + 8.5 + 5 years = 68.5 years beyond cessation of operations. If one assumes reactor unit 1 ceases in 2095 and unit 2 1.5 years later, the earliest that the site can be decommissioned is 2095 +1.5 + 68.5 = 2165.

iii) According to NNB GenCo's 'Radioactive Substances Regulation (RSR) Permit Application Appendix A Support Document A2 – Integrated Radioactive Waste Strategy', in table 5.1 they state, *"A national GDF for spent fuel will not be available to accept new build spent fuel until 2145"*. So how they can claim to have transferred all the spent fuel to a GDF and then decommissioned the SZC site by 2140, is difficult to comprehend.

iv) Attached is a copy of an email received from the ONR (it related to questions asked on 17th June 2020 by TASC, after reviewing the minutes of an ONR NGO forum held at Bridgwater, Somerset in January2020). TASC's questions were listed in red by the ONR and the relevant question was numbered 4.44 by the ONR on page 3 of ONR's response. It was clear from the question that it related to SZC and HPC (if a dry fuel store is to be built at HPC), and HPC was used by the ONR as the reference case in the example.

The note explains that the ONR consider that spent fuel will need to remain on site for 55-60 years after cessation of operations i.e. 2050-2055. The ONR estimate is a best case scenario and assumes: that spent EPR fuel mixing will work; that a GDF is available; that there is no extension of the operational life beyond 60 years; and, that SZC starts operation by 2035, so is not at all precautionary.

TASC further note that NNB GenCo have nowhere justified their assumption that the 2140 date is achievable or a likely date for all spent fuel to have been removed from the SZC site and the interim spent fuel store to have been decommissioned. TASC also remind the EA that in response to a question raised by the ExA, the EA suggested that the guidance in the

document on para i) above was relevant to considering the timeline for the SZC development- see Answer to ExQ R.3.4. 160 years after a start of operations in 2035 indicates a lifetime of the SZC site to 2195, far later than 2140.

TASC also consider the safety of the spent fuel will be put further at risk due to the inadequacy of the Expert Geomorphological Assessment (EGA) and the follow-on implications that this has on flood risk analysis. The EGA is a non-conservative assessment with a timeline that is totally inadequate as it only considers most issues up to 2070, with the latest consideration up to 2087, even earlier than the 2140 date mentioned above and much earlier, therefore, than a more appropriate date that would be a reasonably conservative estimate by which the SZC site could be decommissioned after spent fuel removal. This situation is explored and explained in much greater detail in the attached report by Nick Scarr, an interested party in the DCO examination, 'Sizewell C's EGS-The Applicant's non-precautionary shoreline change assessment for the Greater Sizewell Bay' dated 8th September 2022. While the whole document is of prime importance, TASC draw the EA's attention to Appendix 4 which sets out the ONR's opinion, as of 19th July 2022, *"In our assessment of NNB GenCo (SZC) Ltd.'s application for a nuclear site licence, we noted that the evolution of the coast and offshore sediment has the potential to impact on the coastal flood hazard for SZC. That assessment identified a number of items related to coastal flood hazard characterisation that will need to be resolved prior to detailed design and/or construction of the sea defences."* This clearly indicates that NNB GenCo have not yet demonstrated that that the SZC site can be kept safe from flooding and that the spent fuel can therefore be kept safe.

At section 5.5 of the consultation document, we read of BAT measures to minimise discharges. In respect of tritium, why is there a need to reduce the levels when we have been told for years that tritium discharges are safe at historic levels? What are the benefits in terms of health and environmental impact from these minimisation measures? How can these benefits be quantified? If they are capable of being quantified, by what means will the calculation be made? Are the regulators and the industry prepared to apologise to the public for misleading them about the safety of exposures to tritium and for EDF's repeated refusal to grant SSG requests for a record to be kept of deposition patterns from aerial discharges of tritium? The authorities can't say on the one hand that it's safe and then expect gratitude for reducing an impact they had hitherto refused to acknowledge.

3. Limits and notification levels

On page 58, we read: 'A substantial dilution factor (of approximately 1,400) is achieved by mixing the radioactive effluent into the returning cooling water discharge, which is then discharged via the outfall pond and outfall tunnel into the North Sea. The discharge outfall would be located approximately 3.5km from shore to ensure good dispersion and help prevent reentrainment. NNB GenCo (SZC) states that the location and design of the discharge outfall has been optimised on the basis of marine dispersion modelling. Our assessment (chapter 7) of radiological impacts determined that the group most exposed to aqueous

discharges from Sizewell C, are adult fishermen who would receive a dose of 3.7µSv/y, which is less than 1% of the public dose limit.'

The conclusion that this process achieves a 'substantial dilution factor 3.5kms from the shore' is immaterial. Concentration factors through the food chain negate any benefits this is supposed to bring. The fact that these reactors will clearly add substantially to the overall pollution burden borne by the North Sea cannot be avoided and the fact that adult fishermen would receive a dose which is only 1% of the 'public dose limit' is entirely fatuous: the link between dose and risk has been recognised as unrelated for decades now and the public dose limit has been set arbitrarily using data which is flawed and by methods which are entirely opaque to the public. There is also no guarantee that pollutants discharged 3.5 kms from the shore will stay there and not be washed up on the east Suffolk coast. The EA perhaps need to be reminded of the problems experienced at Sellafield (Winscale) where radioactive particles were found on the nearby beaches after having been discharged out in the Irish Sea.

4. **Assessment of radiation doses to people and dose rates in the environment**

TASC are concerned at the absence of data contained in the document about aqueous alpha-emitting discharges. At 6.8.1, EA says, *'we have not included alpha emitters. We considered alpha emitters at GDA and decided that they did not need detailed consideration as the discharges and impacts were very low. We note that plutonium-241 is not an alpha emitter but does decay to americium-241. However, the quantities of both are not significant.'*

In order for consultees to be able to form a clear picture of what is being proposed, alpha emitting substances are far from insignificant insofar as the ingestion or inhalation of even the smallest micro-particle of an alpha-emitting substance could have significant health impacts for the individual. Does Table 6.2 (gaseous discharges) also omit alpha emitters?

Appendix 1

Additional comments from TASC:

These permits are for operational **twin** EPRs. These permits appear to be more for PR purposes than necessity as clearly HPC will not be fully operational until 2027 at the earliest and the single "pilot" EPR plant Flamanville 3 is not yet operational and may have to operate at reduced output due to a faulty pressure vessel lid. The explanation on page 8 of 30 of the consultation documents is therefore misleading in that there are actually two EPR reactors proposed for SZC giving a total output of 3,260 megawatt as at HPC. The limits referred to and proposed in the consultation document are therefore understood to be for two reactors operating in combination. The publicity for SZC claims an output for electricity to supply 6 million homes and claims to be low carbon without any evidence that can be scrutinised and assessed. There are 350,000 homes in Suffolk. The management of such enormous amounts of electricity on the National grid may prove difficult, since load following may result, for example, in excessive use of boron in the circuit, which could result in excess discharges to the marine environment and excess stack emissions. This was, we believe, identified on Sizewell B when it was operating at half power due to grid instability during Covid

lockdown. The single turbine set up of the reactor further limits the flexibility of the plant and we note the boron issue is an outstanding assessment finding for HPC.

Annex 1 Radioactive substances activity (ref EPR/HB3091DJ/A001). TASC disagree about permissions for radioactive emissions and waste disposal. We disagree about radiation dose and do not accept that the effect is of no concern. Sizewell B tritium limits were changed after the first period of operation, and we have no confidence that this will not happen again. As a minimum, HPC should be adopted as the pilot plant to gain understanding of most of the emissions for this permit. Even then, surely, limits should be set for each reactor individually as well in combination.

Annex 2 Combustion activity (ref EPR/MP3731AC/A001). TASC disagree with combustion activity discharge as diesel may not be Best Available Technique when diesel equipment is no longer in production. Twelve diesel generators of a type as yet unspecified, operating in support of twin EPRs, cannot be envisaged to be BAT by a potential 2035 start-up date or for the proposed 60 years of operation. We find it questionable that the combustion discharge activity is monitored when there is no requirement to justify the overall footprint of the whole project. TASC also consider that any cumulative combustion activity discharge assessment should take into account any diesel powered back-up that might be required for a permanent desalination plant should that be the chosen potable water supply solution for Sizewell C's 60 years of operation.

Annex 3 relates to the Water discharge activity permit which TASC have addressed under separate cover.

To conclude, TASC disagree with EA's intention to issue these environmental permits without the confidence drawn from proven operational experience of a twin reactor EPR and still believe plans to issue these licences to be premature.

Appendix 2

Previous comments from TASC which are still relevant: text of earlier response dated 30 September 2020:

A response from Together Against Sizewell C:

Sizewell C is, at the time of writing, at least 15 years away from being 'deployed', if it ever is. For these permitting consultations to be carried out so far in advance of such a contentious and uncertain development coming to fruition is bizarre, especially in light of the fact that authorised discharge levels are likely, in that period of time, to be dramatically reduced as more evidence is brought to light on the issue of low level radiation and its effects on health, especially the health of children, and force the authorities to accept the inadequacies of the current regime.

Opening statement on EA's website in respect of the three permitting consultations:

Any company that wants to operate a nuclear power station will have to show that it can build, commission, operate and decommission it safely and securely, whilst protecting the environment and managing radioactive waste.

TASC response:

EdF does not meet any of these criteria and therefore does not qualify as a competent developer. It has admitted in the DCO documentation that it does not have the funds with which to construct the plant or even fund the compulsory purchases required. If it can't build the plant, then how can it possibly satisfy EA's criteria? It has not shown that it can build, commission, operate nor decommission an EPR safely: both Flamanville and Olkiluoto are behind schedule and massively over-budget, hardly demonstrating competence in any of these areas. No company with aspirations to be a nuclear plant operator can possibly meet the decommissioning criterion: no UK plant has ever been decommissioned, so how can EdF demonstrate to EA's low-bar standards that it can do so? As for conventional safety, EdF has a track record of imposing lax Covid-19 controls on its workforce at the Hinkley site. In June 2020, a silo collapsed on the Hinkley site. In terms of radiological safety, any discharge resulting in exposure to the workforce or the public is unsafe, as the EA itself admits. How, then, can EdF demonstrate that it can safely and securely operate a nuclear power station?

A new Radioactive Substances Activities environmental permit application (reference EPR/HB3091DJ/A001): this is for the proposed disposals of radioactive waste to air, water and by transfer. Following our determination of this application, we will only issue an environmental permit if all legislative requirements are met. Any granted permit will require the operator to minimise the radiological impact on people and the environment.

TASC response:

The meeting of legislative requirements which appear to be the criteria used to determine the application, represents a false standard in that the legislative requirements themselves are based on flawed science, ignorance and a refusal of the regulatory authorities to engage with the growing body of evidence which strongly suggests that contemporary exposure limits are woefully underestimating the true impact of ionising radiation. The 'linear no threshold' principle which underpins authorisations for radioactive waste discharges has long been discredited as flawed: the relationship between 'dose' and 'risk' from that dose can no longer be relied upon and therefore even tiny doses, such as those from alpha-emitting 'hot particles' of plutonium and uranium, which are incapable of detection by 'groundhog' machines which scour the beaches of Cumbia to suck up such material, are now thought to deliver a concentrated dose to a small group of cells within the body after ingestion or inhalation.

In the light of these uncertainties, minimising the radiological impact on people and the environment is itself a hollow statement and offers no comfort to those living and working in close proximity to the plant. The EA should set a level of exposure which they are confident is safe and hold operators to that limit rather than asking them to adhere to the 'as low as reasonably achievable' principle which simply allows discharges to increase to the level of

funding a company is prepared to commit to reduction strategies. That presents the problem of determining what is a 'safe' level and, as there is no absolute safe level and as the basis on which radiological protection is founded is deeply flawed, it would seem that no company can meet these criteria with confidence. The EA should have the courage to acknowledge these uncertainties, draw them to the attention of the Department of Health, BEIS and other agencies such as the Committee on the Medical Aspects of Radiation in the Environment, and urge a thorough examination of the glaring inconsistencies in the 'linear no threshold' approach and the discrepancies between theoretically predicted outcomes from radiological incidents and the actual health consequences experienced.

*The EA operates a yardstick by which it assumes that the maximum risk presented by any nuclear facility must cause no more than one fatal cancer in a million people (the 10-6**)** principle. This is a placatory and entirely theoretical yardstick which has more to do with encouraging acceptability in the population than it has to do with science. It can no more be demonstrated than can the other fatuous claim made by regulators about the safety of the dose to the workforce or to the public as a result of an accident.*

A new Combustion Activities environmental permit application (reference EPR/MP3731AC/A001): this is for the proposed operation of diesel generators to be used to provide back-up electrical supply at the site. Following our determination of this application, we will only issue an environmental permit if all legislative requirements are met. Any granted permit will require the operator minimise the impact of this plant on people and the environment.

TASC response:

There is not much to be said about this proposed permit application beyond pointing out the irony of using diesel back-up in what is supposed to be a state-of-the-art nuclear plant, especially as diesel is being phased out as an environmentally harmful material. It would be useful if the EA made public the level of particulate contamination from the diesel generators and the public health threat they pose.

A new bespoke Water Discharge Activities environmental permit application (reference EPR/CB3997AD/A001): this is for the proposed discharges of cooling water and liquid process effluents during operation of the power station. Following our determination of this application, we will only issue an environmental permit if all legislative requirements are met. Any granted permit will require the operator to minimise the potential for pollution, thereby protecting the environment and human health.

TASC response:

The intake and discharge of cooling water for a notional Sizewell C is a contentious issue in that there are three major areas of concern: radioactive contaminants in water discharges after it has done its job of cooling, thermal pollution from heat picked up during the water's journey around the reactor and the effect on fish and marine life due to the huge daily intake of water.

Details of these areas of concern are unknown to the author of this response and therefore only generalisations can be made at this point.

Radioactive contamination: the water picks up neutron contamination through the reactor activity on its way through the machine. The effect on the marine environment, on people swimming in the sea affected by the contamination is unknown.

Thermal contamination changes water temperature and can force marine life to migrate away from the area, causing a change in the biodiversity of the location. It can cause oxygen depletion and increased bacteria levels. It can also cause algal blooms, in extreme cases resulting in a reduction in light penetration and hence the photosynthesis process.

Marine life has a natural rhythm of growth and metabolism. The rapid increase in water temperature can affect this pattern negatively, causing an unnatural speeding up or a slowing down of the metabolic rate, resulting in a change in feeding habits and the upsetting on the balance in a stable marine ecosystem.

Many nuclear reactors around the world have been brought close to closure due to the rise in cooling water caused by climate change. The further increase in water temperature brought about by thermal pollution will only serve to exacerbate this problem as time passes and as the effects of climate change become more apparent.

Sizewell C, if it is ever built, is likely to require a massive 120,000 litres of cooling water every second. If a fish and marine life deterrent system is not fitted, probably due to the fact that cash-strapped EdF refuses to pay for it, the effect on fish will be catastrophic. Huge numbers of fish and other marine wildlife will be sucked into the intake pipe and spat out into the marine environment in a mutilated state. Surely this cannot be allowed to happen and the Environment Agency will rightly be accused of impotence and forelock-tugging to the nuclear industry if it allows such an environmental crime to occur. We submit that direct cooling should be banned and the overall principle of thermal cooling plants using water needs serious consideration when adequate alternatives for energy production exist.

Text of a recent email to Alan McGoff, policy lead for new nuclear build at the Environment Agency:

"At the recent EA/NGO telephone conference to discuss EA environmental permitting for a notional Sizewell C, you kindly suggested that any information I wished to pass on to you relevant to low level radiation would be taken up with Public Health England.

To that end, I draw your attention to the weblink for the Children with Cancer UK-funded report on ionising radiation which clearly demonstrates that evidence from around the world points to far greater health impact than predicted from currently accepted dose/risk models (see: http://www.llrc.org/children.htm). I would be pleased to hear PHE's reactions to this report and, more specifically, to the question:

With reference to the communication recently submitted to Health Physics by Dr. Busby

(attached) will EA ask PHE to appraise the dose from uranium234 to the Life-Span Study population and will they consider the impact of that information on the reliability of ICRP risk factors as applied to the SZC fuel cycle cradle to grave?

In terms of more general questions, I would appreciate EA's response to the following:

1. At what point does the EA say to government that the environmental impact of a notional Sizewell C on the proposed site is too great?
2. What yardsticks does the EA use in terms of tonnage of fish killed, acres of AONB destroyed, hours a day of noise and dust created, potential impacts from coastal erosion etc before it advises HMG that the development should be halted?
3. What will be the total gaseous alpha emissions and total particulate alpha emissions from the notional Sizewell C plant in terms of volume over the lifetime of the plant?
4. In what isotopic form will these emission be?
5. What size will the particulates discharged be?
6. How will the size of the particulates be monitored?
7. How will the EA calculate the health impact of these discharges?
8. Will the EA calculate a range of potential health impacts using ICRP/PHE recommendations as well as those from the European Commission on Radiation Risk (ECRR) – i.e. optimistic and pessimistic?
9. Will their calculations and results of expected health impacts be made public and if not, why not?

I look forward to your responses at your earliest convenience, Alan, and thank you in advance for your considered replies and for those from PHE.

Pete Wilkinson

Chairman TASC

22 June 2021"

Attachments to the 2022 permit consultation:

Email from the ONR to TASC, August 2020

Nick Scarr's report ''Sizewell C's EGS-The Applicant's non-precautionary shoreline change assessment for the Greater Sizewell Bay" dated 8th September 2022