Response to REP7-052 Deadline 7 Submission - 9.71 SZC Co Responses to ExQ2 Volume 1 Part 3
Bill Parker Interested Party No 20026713

Dear Planning Inspectorate

I note that EDF have responded to questions you have raised following my submissions to the DCO process. Outlined below is my response to the EDF / Cefas responses which I feel have been inadequate or inappropriate.

My comments are in blue and are as follows:

GC. 2.0 Impacts on coastal processes
Question: (i) Please provide further details and explanation as to how the design of the sea defences would provide adequate safeguard against this risk?

Response from EDF: i) All external hazards, including those associated with coastal flooding (e.g. tsunami), are being treated as part of the Nuclear Safety Case (required under UK law) in line with the appropriate regulation, standards and relevant good practice including the Nuclear Site Licence Conditions (notably Licence Condition 14). The sea defences form part of the protection against coastal flooding. Their design includes consideration of the associated hazards such that they can be demonstrated as being able to provide the required level of protection in line with the ALARP (as low as reasonably practicable) principle.

Comment from Bill Parker:
No useful explanation is provided by EDF / Cefas to your question and this response is inadequate.

Question (ii) In relation to “Storrega-type” Tsunami events, the Applicant indicates that they have an estimated return period of 1 in 10,000 years. Please explain how the design of the sea defences would respond to this risk or has provision been omitted due to the anticipated infrequent occurrence?

Response from EDF: ii) In regard to the risk of tsunamis, a bespoke analysis carried out for the Sizewell site in order to characterise the hazard based using reports issued by DEFRA. A "Storegga5-type" event has been considered within this assessment. As per the response to i), the design of the sea defences includes consideration of all the appropriate hazards such that their design can be demonstrated to provide the required protection in line with the ALARP principle. As with all hazards, tsunami is considered within the safety demonstration and Nuclear Site Licence application.

Comment from Bill Parker
No evidence is provided by EDF / Cefas to your question and this response is inadequate.

Question (iii) Has the potential for climate change to impact upon the frequency and severity of tsunamis been taken into account in the sea defence design?
Response from EDF: iii) The implications of the latest climate change science and understanding (UKCP18) is being considered on all hazards in line with regulator expectations (see ONR UKCP Position Statement).

Comment from Bill Parker
No evidence is provided by EDF / Cefas to your question and this response is inadequate. I note that within the ONR position statement Tsunami isn’t mentioned and therefore whether reliance on this statement is relevant or sound.

CG.2.6 Impacts on coastal processes

At DL5 the Applicant submitted a revised version of the CPMMP [REP5-059]. Please indicate whether there are any further concerns:
(vi) whether any further changes/provisions are required to safeguard the Coralline Crag from avoidable unnatural deterioration?

SZC Co. Response at Deadline 7

(vi) As shown in the assessments detailed in Volume 2, Appendix 20A of the ES [APP312] and Section 2.15 of the ES Addendum [AS-181], the impacts on coastal geomorphology are localised and do not reach the Coralline Crag ridges at Thorpeness – that is, there is no pathway to impact. Section 1.3 of the Written Submissions Responding to Actions Arising from ISH6 [REP5-118] highlights that anthropogenic ocean acidification would not affect the integrity of the Coralline Crag across the life of the station

Comment from Bill Parker

This question was not asked of EDF / Cefas however they responded anyway. No scientific evidence is provided by EDF / Cefas to back up the assertion that anthropogenic acidification would not impact on Crag, again the response is inadequate.

CG.2.14 The Applicant Impacts on coastal processes

The Alde and Ore Association Written Submission for DL5 providing commentary on ISH 6 [REP5-187], submits that the CPMMP should have a wide geographical coverage going at least as far south as Shingle Street with appropriate time intervals for monitoring. That proposition is supported by other IPs including Mr Bill Parker.
(i) If an extension to the monitoring area is not agreed, please explain further why the monitoring is only considered to be necessary within the area proposed;
(ii) Without baseline monitoring for the wider neighbouring coastline how would any unusual changes and/or adverse effects resulting from the proposed development in such wider locations be recognised and mitigated?
(iii) In any event, should funding be provided and secured in order to mitigate against such an eventuality?

SZC Co. Response at Deadline 7

(i) The rationale for the monitoring extent is covered in CG.2.8 above as well as in the Written Summaries of Oral Submissions made at ISH6: Coastal Geomorphology (14 July 2021) [REP5-111], SZC Co's responses to the National Trust [REP6-024, Appendix G] and Local Impact Report LIR Ref. 11.48 (iv) [REP3-044]. The key points behind this rationale and why it should not be extended to Shingle Street (or indeed Thorpeness, as discussed in CG.2.8) are:

• the predicted impacts of Sizewell C fall well within the Greater Sizewell Bay and do not extend to, or near, Thorpeness. Therefore, there is no rationale for Sizewell C to monitor there. The extents set out in the CPMMP [REP5-059] are always larger than the predicted impacts, to allow for any uncertainty;
• the Coastal Processes Monitoring Plan (CPMMP; [REP5-059]) is adaptive and monitoring extents would be extended were impacts demonstrated to move beyond their anticipated extents;
• impacts would start to develop at Sizewell C and radiate outwards so that impacts closer to the site would effectively provide an "early warning" of impacts further afield (no wider regional or systemic impacts could develop without significant local scale impacts being detected first);

• the Sizewell C development does not remove sediment from the coastal system; on the contrary, it adds sediment (via episodic erosion of the maintained SCDF over the life of the station).

Comment from Bill Parker
This is a response deigned to limit the possible liability of EDF and Cefas not in the interests of having a good understanding of what the impact is or potentially could be on adjacent coastlines. It is a very tightly drawn assessment and ignores the potential impact on Sizewell C from other changes along the coast or any asymmetric impacts that Sizewell C could generate that are not immediately obvious in the short term. It is too narrow in its focus for the length of time of the proposed development.

(ii) As impacts radiate outward from Sizewell C, the adaptive monitoring proposed in the CPMMP [REP5-059] would extend the monitoring extents if impacts moved beyond their predicted envelope. The baseline East Anglian Monitoring Programme provides a long (30 years), high-quality record that could be drawn upon were this to occur i.e., if the impacts and monitoring extents were exceeded. Further commentary on this matter can be found in the paragraphs 1.4.24 and 1.6.9 of the Written Summaries of Oral Submissions made at ISH6: Coastal Geomorphology (14 July 2021) [REP5-111].

Comment from Bill Parker
There is an assumption here that others will take responsibility for identifying potential SZC impacts this is not acceptable.

(iii) As there is no evidence to support the widening of the monitoring area, it is not considered appropriate or necessary to provide and secure funding for this eventuality. As the CPMMP is adaptive, to the extent that its area does require to be extended in the future, this will be agreed pursuant to Requirement 7A of the DCO/Condition 17 of the DML and SZC Co. are then obliged to implement the CPMMP in accordance with its approved details (Requirement 7A(2) and Condition 17(2)). This is an absolute obligation on SZC Co. to carry out the actions required by the CPMMP and in order to discharge that obligation, it would need to ensure that it has sufficient funds to do so. This would be necessary to ensure compliance with the DCO and so avoid the criminal sanction that would exist were it unable to meet its obligations

Comment from Bill Parker
It is positive to have clarification that it is 'an absolute obligation on SZC Co. to carry out the actions required by the CPMMP'. However the key question must be, is the scope of the CPMMP wide enough and does EDF (or subsequent owner / responsible party) have any veto in the decisions as to what is included or not included and what the mitigating actions should be? This needs to be resolved and made crystal clear in the drafting of the CPMMP.

CG.2.15 The Applicant Impacts on coastal processes
The DL5 submission of Mr Bill Parker in relation to ISH6 [REP5-191], highlights some areas which he submits have been overlooked in the modelling provided to date and is critical of the assumptions underlying the EGA including the use of 'reasonably forseeable' conditions.
(i) Please respond to those criticisms and summarise why the approach to monitoring utilised by Cefas can be regarded as robust.
(ii) Please provide clarification on the methodology on ground strengthening and the foundations for the HCDF as highlighted by Cllr Robin Sanders at ISH6 [REP5-180].

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SZC Co. Response at Deadline 7
(i) The following response is provided as two sections to match the question – (a) Mr Parker's concerns that some areas have been overlooked in the modelling and (b) assumptions regarding the EGA for determining whether SCDF mitigation is needed to avoid disruption to longshore transport by an exposed HCDF.
(a) Modelling (as outlined in Mr Parker's point 2 (a) d) All of Mr Parker's concerns are addressed in SZC Co.'s DL7 topic-based response (Doc. Ref. 9.73) to DL2 Written Representations on Coastal Geomorphology (specifically Nick Scarr [REP2-393], Bill Parker [REP2-230], Natural England [REP2-152], SCAR [REP2-509], Stop Sizewell C [REP2-449r], Minsmere Levels Stakeholders Group [REP2-377], The National Trust [REP2-150] and The Alde and Ore Association [REP2-204]) and SZC Co.'s separate DL7 response (Doc. Ref. 9.73) to the unaffiliated review of BEEMS Technical Report TR311, written by Derek Jackson and Andrew Cooper and submitted by Stop Sizewell C [REP2-449].

Key responses to Mr Parker's points are summarised here using his numbering.

i. Multiple storm scenarios. The modelling conducted is primarily for predicting impacts, and therefore follows the standard EIA worst-case approach. This approach, including model types and conditions, were developed in consultation with the Marine Technical Forum since 2015. BEEMS Technical Report TR545 [REP3-048] also includes multiple design storm scenarios and an extreme storm sequence.

Comment from Bill Parker
I disagree the scope of TR545 does not include extreme storm sequences, I assume that will be released for Deadline 10 and therefore this statement appears to be incorrect.

ii. UKCP18 sea level rise and the lifetime of the station. SZC Co.'s assessment has considered the station lifetime scale (to 2140) – see for example the modelling in the DL5 version of BEEMS Technical Report TR545.

Comment from Bill Parker
The assessment till 2140 is a) too short, it must be till 2190 as required by ONR / EA coast management assessment and b) it has not taken into account potential future increases in sea level rise. Each series of predictions made through research has consistently been an increase in sea level on previous assessments and the research on glacier melt (e.g. Western Antarctic ice sheet) has indicated that it is faster than previously thought. Therefore, there is a failure to take a more precautionary approach on this issue.

iii. Shore-face connected ridges. These morphologies have been identified on eastern North Sea Dutch and German shorelines but are not present at Sizewell.

Comment from Bill Parker
The North sea is a single connected entity and therefore to ignore these issues is not compatible with a precautionary approach to the coastline.

iv. Sea level rise assumption for EGA. The EGA observed that sea level has been rising throughout the period for which shoreline change data at Sizewell has been collected. The fact that shoreline change in response has not been regionally coherent highlights that the response to SLR is not a linear,

predictable outcome and that the system has absorbed this rate of rise. SZC Co. therefore does not consider it unreasonable to project that this manner of response would continue. The EGA nevertheless projected an additional, linear estimate of change (as a worst case, despite there being no evidence that this is how the system will respond) alongside the assumption of an ongoing, non-linear system response. The EGA noted that rates of SLR are projected to increase more quickly beyond 2070 and did not attempt to apply this method to periods for which more rapid rise is expected. Using this method, the EGA determined that unmitigated shoreline change would expose the HCDF between 2053 and 2087 –the earlier dates in the range represent the possibility of faster rates of sea level rise (amongst other factors) contributing to faster shoreline retreat.

Comment from Bill Parker
The limited time horizon of the EGA makes little sense in viewing the long term vulnerability of Sizewell C. I also note that the EGA was a) not independent and b) had constraints / conditions placed upon it within which to make its comments. It is therefore of restricted value in responding to this point.

v. Wave climate and sand banks. The UKCP18 climate change predictions for the Sizewell coast shows a decreasing wave climatology (in terms of mean annual and maximum wave height (up to 12% subject to which RCP climate change scenario is considered). Please refer to our response to CG.2.11 regarding the Sizewell – Dunwich Bank and its role for inshore waves. Mr Parker's comparison with adjacent sandbanks neglects the fact that the two do not share similar behavioural properties – there is no evidence of cyclic behaviour in Sizewell – Dunwich Bank, whereas there is evidence of cycles in the Great Yarmouth Banks (a sequence of several interconnected banks extending north from Kessingland).

Comment from Bill Parker
The behavioural properties of these banks will be within the current conditions. When there is increased water depth through sea level rise, changes to storminess and other impacts of climate change this may not continue to demonstrate the same properties. The examination of past behaviour is not always a predictor of future.

vi. Mr Parker (and Derek Jackson and Andrew Cooper in their review submitted as the Written Representation of Stop Sizewell C [REP2-449r]) has incorrectly interpreted the cited papers (Bonaduce et al., 2019 and Grabemann and Weisse, 2018). SZC Co. considers that both submissions refer to Grabemann and Weisse (2008) and that 2018 is an error. This means that the Grabemann and Weisse paper was produced 13 years ago and not with the latest UKCP18 predictions, which SZC Co. is required to use and has used. Nevertheless, these papers are, in fact, in agreement with the UKCP18 assessment for the Sizewell area that climate change will lead to a reduction, not an increase, in mean annual and maximum wave height.
SZC Co. accepts that historically a hypothesized increase in the dominance of NE waves, importantly combined with virtually no Dunwich Bank, could have driven the observed severe erosion at Dunwich (and accretion in the southern half of the GSB including Sizewell). This case is accepted but was not considered in detail with respect to coastal geomorphology as it does not present a worst case for impacts of Sizewell C nor hazards to the station.

Comment from Bill Parker
The challenge to Prof. Andrew Cooper and Prof. Derek Jackson (both distinguished academics in the field of coastal geomorphology) assessment is concerning. I defer to the senior academic expertise

and this issue should be resolved through academic consensus rather than taking just the Cefas interpretation of the science.

vii. Longshore transport. The assumptions to which Mr Parker refers are unclear to the Applicant. The development of the evidence base presented in Volume 2, Appendix 20A of the ES [APP-312] included examining the scientific literature on longshore transport in the area and the use of longshore transport models to quantify rates of movement and how they vary under changing conditions. The likely increase in transport rates with SLR is recognised. However, whether this leads to erosion or accretion at specific locations is dependent on multiple other factors, including sediment supply. The worst-case assumption that net erosion on, and adjacent to, the development site (at greater or lesser rates) remains valid in any case.

Comment from Bill Parker
I agree that there could become an increased vulnerability to SZC if the longshore drift has less sediment supply to the erosion rates at Sizewell and this is a factor that is difficult to predict into the future, but must be regarded as a risk to the site.

(b) EGA:
The EGA was an exercise in determining what was reasonably foreseeable with respect to whether (and when) the HCDF without mitigation would be exposed, and at what point change becomes too uncertain to project. The EGA projected change only as far as this 'upper limit to reasonable projection of change' and determined that the HCDF was likely 'reasonably foreseeable' for the project lifetime and no such assumption has been applied.

Comment from Bill Parker
The EGA indeed did identify a period of time when the HCDF would be exposed, which I don't dispute. However, the real benefit from having an independent (unlike the EGA) would be to estimate how the coastline may develop esp. as modelling becomes increasingly unreliable through time.

(ii) In the written summaries of Oral Submissions at ISH6 9.46 [REP5-111], it is stated that the ground treatment would most likely comprise rigid inclusions. We note that the purpose of the ground treatment would be to transfer the load from the sea defence into competent strata below the soft material. In civil engineering these techniques are used widely and have established design codes and guidelines that are applied. The sea defence design report [REP2-116] will be updated to expand on the ground treatment proposals.

Comment from Bill Parker
I await the further information, however this is now very late in the process and will need to be examined in detail once released.

CG.2.16 The Applicant, ESC Impacts on coastal processes
The DL5 submission of Mr Bill Parker in relation to ISH6 [REP5-191], suggests that certain aspects should be built into the structure of the Marine Technical Forum including having meaningful local community membership and being open to public scrutiny. Please indicate whether it is agreed that such inclusion and external scrutiny would be beneficial and should be accommodated?

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SZC Co. Response at Deadline 7
Local community membership of the Marine Technical Forum would be inappropriate. The MTF is a regulatory forum for regulators and their technical experts only. The MTF's Terms of Reference make it clear that its purpose is to facilitate dialogue between SZC Co. and the regulators to ensure that all monitoring obligations are properly satisfied, stating 'The MTF is primarily focussed on… the successful specification, planning, implementation and reporting of all forms of marine and coastal monitoring associated with SZC that are needed for the proper protection of the environment and compliance with UK law'. External scrutiny is already provided by the four regulatory stakeholders and their expert advisors. Once approved, the Annual and Substantive (ten-year review) reports of the CPMMP will be made publicly available. As such, expanding the membership as suggested would not be beneficial, is not necessary and would disrupt important regulatory processes.

Comment from Bill Parker
The assumption that 'the successful specification, planning, implementation and reporting of all forms of marine and coastal monitoring associated with SZC that are needed for the proper protection of the environment and compliance with UK law' would exclude local expert input would be a mistake. Indeed, it would provide an essential additional component to the 4 key regulators, namely the local community input. The failure to effectively engage with the local community and bring them onboard with the entire Sizewell C project demonstrates how the disregard of local views have hampered this project development. It would be unfortunate if EDF assumed that there not suitable responsible representative locally who a) couldn't understand the complexity of the research or results or b) wouldn't add value to the MTF to ensure it was a more effective body. This response should be reconsidered.

Bill Parker
23/9/21