

EN010012 ExA Deadline 3 Comment

Application by NNB Generation Company (SZC) Limited for an Order Granting Development Consent for the Sizewell C New Nuclear Power Station

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D3.1 Gross asymmetry: representation resource capacity

D3.1.1 As an unresourced lay Interested Party, lack of equality of arms in resource capacity continues to hamper ability to consider properly the full set of documentation submitted by the Applicant, Statutory Consultees and Non-Statutory Consultees to date.

D3.1.2 According to the Examination Library (as updated 18.06.2021), the Applicant alone has introduced around 131 new documents subsequent to Deadline 2. This fetches the Applicant's total to date to approximately 1,128 documents, varying in complexity and size.

D3.2 REP1-013: the Applicant's failure to respond specifically to specific issues in RR-509

D3.2.1 This Commentary comprises an appraisal of the Applicant's REP1-013 response to RR-509. To the extent, that is, it has proven possible to spot a response under the various Tables in REP1-013. The question being: has the Applicant actually provided substantive additional relevant information, in response to apparent insufficiency in Application documentation as raised in RR-509?

D3.3 Inaccessible Section 4 Themed Responses in REP1-013: missing RR references

D3.3.1 The Applicant's responses to all RRs in REP1-013 are spread across 32 Tables in Section 4, split under thematic headings. That has resulted in different points in any particular RR also being split up across any number of different Tables. However, in none of the Tables has the Applicant identified the appropriate RR Reference, begging a question: in which particular RR did the particular issue addressed by the Applicant arise?

D3.3.2 The implication for any particular IP is not without consequence. The omission of RR Referencing has significant practical ramification, making it virtually impossible to relate the Applicant's response to any particular point under any particular RR. In other words, the Applicant's response to any particular point in any particular RR is rendered effectively inaccessible. Attempt at navigating all 32 Tables in order to find a response to a particular point in a particular RR is elevated to high frustration. The Applicant identifies only an aggregate number of responses in the final column of each table.

D3.3.3 Is it reasonably acceptable for an Applicant to submit such an inaccessible presentation of response to Relevant Representations? How could that be fair on individual IPs? How could omission of appropriate RR References be held as signifying good practice, particularly in the setting of a complicated DCO examination?

D3.4 Funding Statements APP-066, AS-011 and AS-150: Table 4.4 in REP1-013, pages 37-41

D3.4.1 Para.4.3 in RR-509, regarding APP-066 insufficiency, is still not addressed relevantly in Table 4.4. The requested specific information on China General Nuclear Corporation is not provided. The Applicant's AS-011 and AS-150 continue to remain equally deficient.

D3.4.2 Para.4.1.a in RR-509 has not been addressed relevantly in Table 4.4 (pages 38 and 40, respectively).

- a. The requested information regarding both the projected generation cost per kWh and the likely "strike price" continues to remain outstanding.
- b. In this regard, even AS-011 and AS-150 remain deficient, despite assertions at para.3.1.4 in AS-011 that,
 - (i) "Sizewell C is a replica of HPC ..."; and,

- (ii) “SZC Co has grown and will continue to operate on the basis of learning from HPC. This replication strategy allows the cost of energy produced at Sizewell C to be substantially less than that produced at HPC.”

D3.4.3 According to para.3.1.2 in AS-011, the thrust of the Catapult report (published June 2020: reproduced in full in Appendix A) turns on a cardinal caveat. Namely,

“... if nuclear is able to fulfil cost reduction potential ...”

However, on the question of Sizewell C’s commercial viability, the Applicant adduces scant evidence detailing actual cost reductions realised to date for the SZC DCO project subsequent to the publication of the Catapult report, and subsequent to the commissioning of the world’s first EPRs at Taishan in China¹. The omission is materially relevant given the clear emphasis in section 2.2.3 of the Catapult report:

“ESME is not a commercial market model, and the inputs and outputs should not be considered as if ESME was a commercial market model.”

Note: As explained in section 2.2 of the Catapult report, ESME is a bespoke whole energy system model employed by the report’s authors.

D3.4.4 In this regard, perhaps the ExA might respectfully consider scrutinising closely the Applicant’s sweeping assertion in AS-011 para.3.1.8 and in AS-150 para.3.3.8, respectively. Namely, that:

“funding is not considered to be an impediment to the implementation of the Sizewell C Project ...”

- a. In the first instance, the Applicant has failed to address relevantly para.4.1.b in RR-509: Table 4.4 (page 38), referring.
- b. Secondly, the Applicant’s confidence rubs against the conclusion reached by Hitachi’s Board of Directors in Tokyo. Hitachi decided on 27 January 2021 to write off a £2 billion expenditure^{2,3} on a DCO Application for the construction, operation and maintenance of two large Generation III+ reactors at Wylfa (on the Isle of Anglesey, off the coast of North Wales). That mammoth project was cancelled on the grounds of high cost and doubtful commercial viability for the private sector global industrial giant, despite prolonged negotiations with BEIS on a suitable funding model for Wylfa. Hitachi abandoned the Wylfa Newydd project well after the closure (on 23 April 2019) of the ExA’s Examination into the Wylfa Newydd DCO Application, but prior to the Secretary of State’s final determination of a Decision on a Grant of DCO (pencilled at the time for 30 April 2021)⁴.

¹ According to the Applicant in Tables 4.5 and A.20 in REP1-013 (pages 51 and 411, respectively):
“The EPR™ is a proven reactor design which is now in full commercial operation in China (Taishan 1 and Taishan 2).”

² WNN (2020) Hitachi withdraws from UK new-build project. World Nuclear News, 16 September 2020. Available at: <https://www.world-nuclear-news.org/Articles/Hitachi-withdraws-from-UK-new-build-project>:
“Hitachi had posted an impairment loss and other expenses of JPY294.6 billion (USD2.8 billion) on consolidated financial results for fiscal 2018, the year ending 31 March, 2019 due to the suspension of the project.”

³ Hitachi Europe (2019) Summary of UK Nuclear Power Stations, Construction Project and Posting of Impairment Loss and Related Expenses. Press Release. Tokyo, 17 January 2019. Available at: <https://www.hitachi.eu/en/press/hitachi-announces-suspension-uk-nuclear-power-stations-construction-project-and-posting>:
“It also plans to post losses of approximately 300.0 billion yen associated with the suspension of the nuclear power plant construction project in the UK as extraordinary losses on unconsolidated financial results for fiscal 2018, the year ending March 31, 2019.”

⁴ EN010007: <https://infrastructure.planninginspectorate.gov.uk/projects/wales/wylfa-newydd-nuclear-power-station/?ipcsection=docs>

D3.4.5 The Applicant fails to address adequately para.4.4 in RR-509, regarding unaccountable costs bequeathed to future generations on eventual permanent geo-disposal of the additional radioactive waste from Sizewell C. According to the Applicant in Table 4.4 (page 39):

“The costs of decommissioning, waste and spent fuel management (post end of generation) and disposal of all higher activity waste will be funded through a Funded Decommissioning Programme (FDP) ... SZC Co. must ... ensure that SZC Co. sets aside funds over the operating life of the Sizewell C power station to cover these costs in full.”

In that particular regard, the Applicant has not identified precisely the exact UK Government policy and statutory provision requiring the Applicant to meet the full costs of eventual permanent geological disposal of all spent nuclear fuel, and intermediate and high level radioactive waste inventories accumulated over the operating life span of the proposed Sizewell C DCO project.

D3.5 Sizewell C DCO site selection and need justification: REP1-013

D3.5.1 Site selection justification

D3.5.1.1 It is not readily apparent where the Applicant’s response to para.3.2.3 in RR-509 might be located in REP1-013: para D3.3.2 hereof, referring

D3.5.1.2 The Applicant accepts the 2011 EN-6 National Policy Statement (NPS) does not have effect for the Sizewell C DCO Application. Deployment of Sizewell C evidently falls beyond the time frame of the 2011 EN-6 NPS. Under the circumstances, questions bearing on site selection assessments arise.

- a. In the absence of a formally designated successor to the 2011 EN-6 NPS for nuclear new build between 2026 and 2035 (as per section 6(7) of the PA2008), wouldn’t the default status of the Sizewell site (as included and identified in the 2011 EN-6) change from an approved site to simply a nomination site, in the instance of new build evidently deployable only beyond 2025?
- b. Would such demotion not warrant new site selection justification for the proposed Sizewell C new nuclear power station?
- c. Under what specific policy and statutory provision would the Applicant disagree?

D3.5.1.3 Given that deployment falls outside the time frame of the 2011 EN-6, and given that a successor NPS under PA2008 section 6(7) has not yet been laid before Parliament, is it incumbent on the Applicant to substantiate site suitability assertions in Tables 4.2 and 4.23, respectively, under fresh assessment? Namely,

- a. In Tables 4.2 and 4.6 on pages 21 and 47, respectively, the Applicant states:

“The need for a new power station at Sizewell C is firmly established within the Government’s policy on national significant energy infrastructure. The National Policy Statement for Nuclear Power Generation (EN-6) (NPS EN-6) identified eight sites, including Sizewell C, as potentially suitable locations for the deployment of new nuclear power stations in England and Wales by 2025.”

and, in Table 4.23 on page 180, the Applicant states:

“Sizewell is identified in the NPS for Nuclear Power Generation (NPS EN-6) as one of eight potentially suitable sites for deployment of new nuclear power stations. Annex C to NPS EN-6 confirms that

that the inclusion of Sizewell C in the NPS reflects the in principle acceptability of its location.”

D3.5.1.4 Demotion of the status of the Sizewell site would appear arguably implicit in an acceptance that the 2011 EN-6 has no effect for the Sizewell C DCO Application. Nevertheless, the Applicant maintains a presumption that until a new successor EN-6 is designated, the appropriateness of the Sizewell site for a new nuclear power station deployable beyond 2025 would not warrant *de novo* justification. Consider as well, for example, the Applicant’s assertion in Table 4.2 on page 21:

“If a new Nuclear NPS or new Energy NPS is designated before the Secretary of State makes their decision on the Sizewell C DCO, the decision will be based on the NPSs that have effect at that time.”

D3.5.1.5 Might the ExA perhaps respectfully consider clarifying the issue?

D3.5.2 Need justification

D3.5.2.1 The updated case on need for Sizewell C, as argued in AS-011, rests seemingly on what the Applicant regards as relevant “forecasts”. Namely,

a. AS-011 para.3.1.2:

A report from Energy Systems Catapult, published June 2020 (reproduced as Appendix A). The Applicant accepts the Catapult report turns on a cardinal caveat:

“... if nuclear is able to fulfil cost reduction potential ...”

However, the Applicant fails to adduce detailed evidence to that effect. Moreover, the Catapult report expressly does not claim to model commercial energy markets in the UK: para.D3.4.3 hereof, referring; and,

b. AS-011 para.3.1.3:

The Updated Energy and Emissions Projections 2019, published in October 2020 by the Department of Business, Energy and Industrial Strategy (BEIS). In this regard, the ExA would no doubt note the Applicant’s acknowledgement at para.3.1.4 of an unequivocal BEIS caveat. Namely, whatever the potential importance of nuclear to future Net Zero energy systems in the UK,

“...nuclear cost reduction is a necessary pre-requisite.”

Surprisingly, the Applicant fails to demonstrate the pre-requisite.

D3.5.2.2 In Table 4.6 (page 47), the Applicant claims there exists demonstrable need for Sizewell C on the ground that:

“Of all the low carbon plant that is currently generating, only Sizewell B will still be operating in 2035, with the rest of the existing capacity closing throughout the period to 2035 (including after Sizewell C comes online).”

Evidently, an implication that the Sizewell B nuclear power station would be the only operating low carbon plant in 2035 (in the UK electricity generating system) couldn’t be further from the truth. Perhaps the Applicant might consider clarifying the record.

D3.5.2.3 It is not readily apparent where the Applicant’s specific response to para.3.2.2 in RR-509 (regarding “relevant change of circumstances”) might be located in REP1-013: para D3.3.2 hereof, referring. Nevertheless, in Table 4.2 (page 20), the Applicant repeats an assertion that there has been no relevant change of circumstances, and that:

“Any changes to circumstances are matters for the Government to consider as it reviews the NPSs.”

- a. The Applicant seemingly overlooks “relevant change of circumstances” spelt out in the Minister’s Update Statement to Parliament on 17 January 2019. Particularly, in respect of the economics of the energy market subsequent to adoption of the EN-6 NPS in 2011. According to the 2019 Ministerial Statement⁵:

“The economics of the energy market have changed significantly in recent years. The cost of renewable technologies such as offshore wind has fallen dramatically, to the point where they now require very little public subsidy and will soon require none. We have also seen a strengthening in the pipeline of projects coming forward, meaning that renewable energy may now be just as cheap, but also readily available.

“As a result of the developments over the last eight years, we have a well-supplied electricity market. Our electricity margin forecast is more than 11% for this winter, having grown for each of the last five years. While that is good news for consumers as we strive to reduce carbon emissions at the lowest cost, that positive trend has not been true when it comes to new nuclear. Across the world, a combination of factors, including tighter safety regulations, has seen the cost of most new nuclear projects increase as the cost of alternatives has fallen and the cost of construction has risen. That has made the challenge of attracting private finance into projects more difficult than ever, with investors favouring other technologies that are less capital-intensive up front, quicker to build and less exposed to cost overruns.”

The January 2019 updated Ministerial Statement plainly highlights significant relevant change actually evidenced since 2011, in the delivery of low carbon energy technologies, including nuclear new build. In particular, an incremental trend in commercially viable renewable energy electricity generation across the UK National Grid Network.

- b. In this regard, Section 105 of the Planning Act 2008 could not be said to preclude the ExA from taking into account the 2019 Ministerial Update Statement. The Statement remains arguably material to determination of justification for the proposed Sizewell C DCO project.

D3.6 Further radioactive waste from Sizewell C: amplifying historical legacies (REP1-013)

D3.6.1 The on-site Interim Spent Fuel Store (ISFS)

- D3.6.1.1 It is not readily apparent where the Applicant’s response to para.2.1 in RR-509 might be located in REP1-013: para D3.3.2 hereof, referring.
- D3.6.1.2 It is not readily apparent where the Applicant’s response to paras 2.2.1, 2.2.3, 2.2.4, 2.2.5 and 2.2.6, respectively, in RR-509 might be located in REP1-013: para D3.3.2 hereof, referring.
- D3.6.1.3 It is not readily apparent where the Applicant’s response to paras 2.3.4 and 3.1.3, respectively, in RR-509 might be located in REP1-013: para D3.3.2 hereof, referring.

⁵ Hansard HC (2019) Nuclear Update. Statement by The Secretary of State for Business, Energy and Industrial Strategy. House of Commons Hansard, Volume 652, 17 January 2019. Available at: <https://hansard.parliament.uk/Commons/2019-01-17/debates/9C841326-B63A-4790-867F-905DEDDDD8AC/NuclearUpdate#contribution-AB1CF541-F832-4465-A6BE-437CE42EB8C3>

D3.6.2 Time frames for decommissioning ISFS facilities: REP1-013 Tables 4.5 and 4.28

D3.6.2.1 Introduction

D3.6.2.1.1 Although the Applicant has not addressed specifically para.2.2.2 in RR-509, the Applicant has provided other cursory information regarding the earliest as well as delayed decommissioning of the ISFS facilities. The Applicant plans to retain radioactive waste inventories on-site until a Geological Disposal Facility (GDF) becomes available and able to accommodate the entire waste inventories, at an unspecified date in the future.

D3.6.2.2 Early decommissioning of the on-site ISFS

D3.6.2.2.1 In Table 4.5 (page 53), the Applicant informs that the ISFS facilities would be the final on-site installations to be decommissioned on the proposed Sizewell C new nuclear site. The Applicant claims that could be achieved within 60 years of ending electricity generation, and accomplishable within 5 years altogether. The Applicant is thus confirming that from the date the production of radioactive waste first commences at the proposed Sizewell C new nuclear power station, it would be up to 120 years at the minimum before complete site dismantlement and removal to some measure of green field status is likely to be realised.

D3.6.2.2.2 In this regard, para.2.2.2 in RR-509 remains unaddressed. Namely, what entity is guaranteed to exist for around 120 years to ensure the promised complete early site dismantlement?

D3.6.2.2.3 For the sake of the argument, supposing all DCO Application and funding matters favour the Applicant, with construction commencing in say 2026 (for example) and lasting 12 years. In that case, generation could commence in 2038 and cease in 2098. The main site may be fully decommissioned over the course of subsequent 25 years (say, by 2123). Under the Applicant's presumed time frame, decommissioning of the ISFS may commence in 2153 and end in 2158 at the earliest. Such scenario gives rise to at least two material questions.

- a. What entity is the Applicant is able to guarantee today that would definitely exist in around 2153, capable of commencing and completing all decommissioning work on the on-site ISFS facilities (on what would effectively be an abandoned Sizewell C site)?
- b. Is the Applicant further guaranteeing additionally, that the full costs of care and maintenance of the ISFS facilities between 2123 and 2153, inclusive; as well as the full costs of evacuating and transporting away the entire ISFS radioactive waste inventories; and, the full costs of emplacing and securing the entire waste inventories inside an operating GDF; and, the full costs of site dismantlement, and complete site removal and restoration to some measure of green field state by 2158, would all also be raised in full during the 60-year electricity generating period 2038 to 2098, inclusive? And, what is(are) the Applicant's proposed ultimate source(s) of each separate tranche of full costs?

D3.6.2.3 Delayed decommissioning of the on-site ISFS

D3.6.2.3.1 In Table 4.28 (page 218), the Applicant informs the ISFS facilities would have an initial design life of 100 years (say, up to the year 2158 on the basis of the scenario sketch in para.D3.6.2.2.3, above). The Applicant informs further that, if necessary, on-site storage on the Sizewell C site could readily be extended beyond 2158, "subject to any required refurbishment and or replacement of equipment".

D3.6.2.3.2 Clearly, extended on-site storage could be warranted for any number of reasons, including the following illustrative events. Either a GDF did not yet exist in the UK. Or, an operating GDF was experiencing longer than expected emplacement queues. Or, an adequate void

space capable of accommodating the entirety of Sizewell C ISFS waste inventories was not available within an existing GDF, entailing a hiatus until an alternative GDF became available. Or, the reliable safe operation of an existing GDF was interrupted for a prolonged period. Or, an existing GDF was forced to close prematurely permanently. In other words, the probability of open ended extension of on-site storage could not be ruled out.

D3.6.2.3.3 Such extension scenarios, in turn, give rise separately to further material questions.

- a. What entity is the Applicant is able to guarantee today that would definitely exist beyond 2158, for an open ended period?
- b. Is the Applicant further guaranteeing additionally, that the full costs of any necessary refurbishment and/or replacement of equipment; as well as the full costs of open-ended care and maintenance of the Sizewell C on-site ISFS facilities beyond 2158, would also be raised in full during the 60-year electricity generating period 2038 to 2098, inclusive? And, what is(are) the Applicant's proposed ultimate source(s) of each separate extended tranche of full costs?

D3.6.3 Off-site spent fuel storage

D3.6.3.1 In REP1-013 Table 4.7 (page 82), the Applicant would appear silent on direct responsibility for developing alternative off-site interim storage facilities for spent nuclear fuel: EN-6 Annex B para B.4.4, referring.

D3.6.3.2 It is not strictly correct to assert that,

“The UK Government policy requires that for new nuclear builds, the spent fuel is to be stored on-site”,

only or exclusively and unconditionally, whether for the entirety or part of the duration of an interval, pending removal of the stored inventories to permanent disposal in a suitable GDF at some unspecified future date.

D3.6.3.3 As direct waste producer, it reasonably falls on the Applicant to demonstrate what alternative options were examined and adduce credible evidence into the DCO Examination.

D3.6.3.4 See as well para.2.2.6 in RR-509.

D3.6.4 Geological disposal of higher activity radioactive waste and spent nuclear fuel

D3.6.4.1 The Applicant submits in Table 4.28 in REP1-013 (page 218) that:

“Geological Disposal Facilities are a tried and tested technology and similar types of facilities are currently in operation in countries around the world. As an example, Finland and Sweden who have been operating repositories since the 1990's for the disposal of Low and Intermediate Level Waste. Spent Fuel Repositories are currently undergoing design and construction in Finland and Sweden, along with several other countries..”

D3.6.4.2 With respect, the Applicant appears to overlook salient considerations in that summary. For example,

- a. to what extent are the particular geological, institutional and technological conditions obtaining in Finland and Sweden directly applicable, replicable or transferable to the conditions obtaining in the UK?

- b. Are the volumes, quantities and the condition of relevant categories of radioactive waste in Finland and Sweden similar to the volumes, quantities and the condition of wastes accumulated in the UK since the 1950s (and which would be inflated by new waste from Sizewell C)?
- c. In any case, the Applicant's summary seems silent on disposal of higher level radioactive waste and spent nuclear fuel. No operating geological repository exists either in Finland or Sweden for these types of radioactive waste. Currently, the UK does not even have an investigation site for rock characterisation studies (for example), let alone a clutch of sites for potential GDF suitability assessments.
- d. Regrettably, it seems premature to pronounce Geological Disposal Facilities a tried and tested technology for the disposal of higher level radioactive waste or spent nuclear fuel, safely and securely for perpetuity (over hundreds of thousands of years into the future).
- e. Moreover, the Applicant is notably silent on a UK Royal Commission recommendation dating from 1976. The UK is currently far from grappling with the additional practicalities of demonstrating guaranteed safe containment of all higher level radioactive waste and spent nuclear fuel "beyond reasonable doubt" for the indefinite future (the conditional test under the Royal Commission's Recommendation 27⁶), prior to commencing routine disposals in a suitable full scale Geological Disposal Facility.

D3.6.5 SZC DCO justification on radioactive waste production

D3.6.5.1 Regarding para.4.4 in RR-509, the Applicant would appear silent on justification for producing new and additional radioactive waste under the proposed Sizewell C DCO project. The proposal would directly amplify the cumulative legacies of long lived problematic radioactive waste in the UK.

D3.6.5.2 See as well para.D2.2.4.2 in REP2-320.

D3.7 Major Accidents and Disasters: REP1-013 Table 4.24 (pages 189-195)

D3.7.1 The specific matters raised in para.5.1 in RR-509 continue to remain outstanding in Table 4.24.

J Chanay
24.06.2021

⁶ RCEP (1976) Nuclear Power and the Environment. Royal Commission on Environmental Pollution, Chairman Sir Brian Flowers. Sixth Report. Cmnd 6618. HMSO. According to Recommendation 27:

'There should be no commitment to a large programme of nuclear fission power until it has been demonstrated beyond reasonable doubt that a method exists to ensure the safe containment of long-lived highly radioactive waste for the indefinite future.'