SUNNICA ENERGY FARM

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8.60 Applicant's Response to Dr Edmund Fordham Deadline 3A Submissions

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The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Sunnica Energy Farm
Development Consent Order 202[x]

8.60 Applicant's Response to Dr Edmund Fordham Deadline 3A Submissions

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1 Introduction

1.1 Purpose of this document

1.1.1 This report responds to Dr Edmund Fordham's deadline 3A submissions. The Applicant has responded to these submissions thematically in section 2, under the following three themes:

- Section 2 –
    - Environment – BESS – Fire Safety
    - Client Design
    - Environment – Major Accidents

2 Dr Edmund Fordham Deadline 3A Submissions and the Applicant's themed responses

2.1 Topic – BESS – Fire Safety

2.2 The Applicant has provided a response to purported fire safety issues raised by Interested Parties which is submitted at Deadline 4. This document is called Applicant's response to BESS Safety Issues [Document ref 8.69]. It does not therefore intent to provide detailed responses to all of Dr Fordham's Deadline 2 submissions on BESS Fire Safety Issues.

Theme	Deadline and Document Ref	Summary of issue raised	Applicant's response
EIA conclusion / air quality	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.4 (#2 and #3)*	The Applicant's conclusion that fire risk is not anticipated to generate a likely significant effect is not supported by evidence. The generation of toxic gases / smokes is demonstrated in tests and shown in literature. Either further evidence is required, or the Applicant should accept this as a concern and propose appropriate mitigation.	Firstly it should be reiterated that Appendix 16D: Unplanned Atmospheric Emissions from BESS assessment is a preliminary assessment designed to provide a worst case assessment at this early stage of the design. The assumptions made in the dilution modelling undertaken in Appendix 16D are predominately taken from documents used to support the Cleve Hill Solar Farm application, and have therefore been through the DCO process and been accepted. It has been stated that full consequence modelling will be undertaken at the detailed design stage once the precise details of the BESS is known. As has been set out, the precise details of the physical configuration of the BESS have a huge impact on the consequences of a fire.
Batteries	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.6 (#5 to #9)*	The Applicant's statement that there is relatively little to distinguish between lithium-ion battery chemistries is disputed. The explanation given includes that the metal-oxide cathode chemistries failing more aggressively in terms of speed of temperature rise and maximum temperatures reached.	The consequence modelling will account for the precise battery chemistry.
EIA / air quality	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions*	Many toxic gases and particulates have been ignored in the air quality assessment. Only hydrogen fluoride has been assessed.	The assessment was based on HF as the pollutant most likely to cause harm from a BESS fire. Other pollutants are less likely to be present at distances representative of off-site exposure. A full consequence modelling exercise will be undertaken when the precise chemistry and battery design is known.

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	(ExQ1) – Summary (#10), Qu1.1.6 (#9)	No assessment has been undertaken for hydrogen cyanide (HCN) emissions, despite it being a well-known toxic gas.	
Fire / explosion risk	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#1), Qu1.1.6 (#10 and #14)*	It is not true that there are few differences between Li-ion cell chemistries from a fire risk perspective. Cell chemical type will affect e.g. thermal runaway, toxic gases evolved etc. The distinction between cell chemistry types needs to be made to distinguish between fire hazard and explosion hazard. The chemistry has a key role in the relative risk for fire vs explosion. Risk of immediate fire versus delayed ignition will depend on cell chemistry as well as state of charge of cells and fire suppression systems. A "Fire Safety Management Plan" is not sufficient in view of the explosion hazard.	The consequence modelling will account for the precise battery chemistry.
	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.6 (#11 and #14)*	Vapour Cloud Explosions (VCE) are a serious risk with BESS and have occurred at a number BESS incidents. Slow generation of flammables will tend to promote conditions for VCE and rapid generation promotes immediate ignition.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.6 (#12 and #13)*	The risk of explosion versus fire is complex and probably depends on the rate of generation of flammable gases and the availability of air for combustion. Fire suppression systems will also have a major impact.	This is not disputed.
Fire suppression systems	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions*	Water-based systems are more likely to be effective, but the Applicant appears unaware of the differences in efficacy between metal-oxide cells and LFP cells. A study by the National Fire	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral

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	(ExQ1) – Summary (#2), Qu1.1.6 (#15 to #17)	Prevention Association found that water-sprinkler systems were not effective in fires involving metal-oxide cells, but they could be for LFP cells. A report by *FM Global* was annexed as Annex EF34. In light of this, the efficacy of a sprinkler system with NMC cells is questions, but it could be a positive measure with LFP cells.	Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Hazard to aquatic environment	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#4), Qu1.1.6 (#18 and #19)*	If water from sprinkler systems / external fire-fighting is used to control fire then contaminants in fire water could be a significant hazard to the aquatic environment (noting the Ramsar habitats nearby). This should be considered as part of the BFSMP. The likely contaminants may depend on cell chemistry. A hazard analysis cannot continue to maintain there is no difference between available cell types in fire.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Fire suppression systems	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.6 (#20)*	Any "smothering" system will only increase the risk of VCE. Water-sprinkler may be effective against actual fires in LFP cells but it is unclear with NMC.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
BESS failure	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#5), Qu1.1.6 (#21 and #22)*	The greater the number of cells, the chance of a single cell failure somewhere in the system increases to a stage where a failure somewhere must be accepted as routine within a realistic time period. A single cell failure may lead to a thermal runaway accident, meaning prevention is crucial.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Scope of OBFSMP	Deadline 3A – *Comments on Applicant's responses to Examining Authority's*	The interplay between factors relating to immediate ignition (fire) and delayed ignition (explosion) is complex.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral

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	First Written Questions (ExQ1) – Summary (#3) Qu1.1.6 (#23)	The Battery Fire Safety Management Plan should be a "Battery and Explosion Prevention and Management Plan", to take account of engineering failures analyses set out.	Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Scale of BESS and fire, and measures	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.9 (#24 to #27)*	The BESS will store energy not "power". It is the total stored energy which reflects the maximum possible scale of a fire – the scale of a possible accident and probability of initiating events increase without limit as the BESS' energy storage becomes large. The Applicant's claim that e.g. safety is determined by the "power energy rating of an individual battery enclosure" is unsubstantiated.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.9 (#28 to #33)*	There are examples of cabin-to-cabin propagation of BESS accidents. Until the Scheme's energy storage capabilities of the BESS containers are known, the level of risk posed by even a single-cabin accident is not clear. Until final layouts of BESS compounds and preventative measures (limiting incidents to one container to a nearby container), it cannot be known that fire safety concerns are limited to a single battery enclosure. Given the examples of cabin-to-cabin escalation, it is irresponsible to suggest it is impossible for this to happy again. The concern should be the impact of major escalation. The overall energy storage is the only limiting factor and the larger the scale of a potential accident, the greater the measures required to prevent escalation. No such measures are included in the OBFSMP. Response plans are required close to a BESS accident. The social impact of this hazard would be extreme for affected communities. Also, there could	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.

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		be major environmental impacts e.g. if bunding of contaminated fire water was breached.	
EIA	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.9 (#34 and #35)*	The conclusions of the EIA regarding the BESS appear to be limited to landscape and visual matters. Environmental impacts include toxic emissions in the event of BESS accidents, and they do depend on energy storage capacity. There would be a colossal energy storage capacity and therefore potential emissions of toxics in the event of a major accident. The idea that limiting the energy and power rating of the BESS would not change the environmental and social impacts is not credible.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Mitigation and prevention	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#7), Qu1.1.9 and Qu1.150-1.1.63 (#36 to #42, and #89)*	Safety measures, including those in the OBSFMP, and the design principles are largely reactive and pass on responsibility to local Fire and Rescue Services. Those services cannot be expected to shoulder the responsibility of e.g. assessing the effectiveness of suppression systems. In risk control there is (i) prevention; and (ii) mitigation. Prevention is preferred and the only effective way of managing an explosion is preventing it. The hazards associated with Li-ion BESS is not limited to fire, meaning the emphasis of the OBFSMP is misunderstood. A OBFSMP / BFSMP does not address prevention and fails to pay sufficient attention to health hazards and may even generate environmental hazards in response to fires. As single test report on a fire from a 100 kWh system has no relevance to fires in larger systems.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.

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		A BESS expert has indicated that a 110 kWh fire is not applicable to a large BESS accident.	
Fire / explosion risk	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.14 (#45 to #47)*	The risk / explosion hazard being limited to a single contained is disputed unless extreme measures, supported by tests are taken to prevent cabin-to-cabin escalation. It is not clear why the volume of free air is relevant when thermal runaway accidents require no air to proceed. Although, it might affect the development of a stratified atmosphere leading to Vapour Cloud Explosion.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.14 (#45 to #47)*	The ExA's question regarding "minimising of risk of fire" does not appear to have been answered. Complete coverage to 6m high is such a large hazard that no responsible operator would consider it. Determining the MWh capacity at detailed design is not good enough where there are major safety concerns.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.14 (#45 to #47)*	UL 9540A is a test specification and has no concept of pass/fail so is not a "certification".	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Firefighting – water resilience	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#9), Qu1.1.17 (#48 to #51)*	The Councils and a BESS expert fears the Applicant has considerably underestimated the likely water capacity required during a thermal runaway incident. Despite the suggestion of there being a second tank for firefighting if one fails, there is no resilience. This is with reference to	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.

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		certain examples and the conclusion from them is that two tanks are completely insufficient.	
Life safety critical zones	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.19 (#52 to #55)*	It is unclear what the "life safety critical zones" are which the Applicant indicates residents are outside of. Clarification is sought on how this conclusion was reached (to include what parameters have been calculated to inform this view), and whether the Traveller community on Elms Road has been considered. No explosion hazard analysis has been provided by the Applicant, whilst reference is made to a report by Atkins for the HSE for Northern Ireland covering e.g. explosion risk and toxic emissions. No such report has been prepared by the Applicant, which demonstrates the need for full engagement by the HSE and EA in respect of the Scheme.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Lessons from previous incidents	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.21 (#56 to #60)*	There is often a lengthy delay between an incident and the publication of an investigation report. Therefore, learning points from historical battery fires often are not captured in current guidelines so expert input is crucial. The BESS safety regulatory regime is robust, notwithstanding the relevant legislation being brought forward. However the effect of consenting regimes in terms of existing legislation only has effect if the Applicant engages with them, as law and policy intends.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Mitigation	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions*	An BESS expert does not agree with the Applicant's statement that the OBFSMP presents a comprehensive list of mitigation and control measures. Examples are provided of measures	

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	(ExQ1) – Qu1.1.21 (#61 and #62)	which will not mitigate thermal runway (RMM 10 and RMM17). The expert is unaware of a means by which the Fire and Rescue Service can monitor remotely an explosive atmosphere	
Industry standards	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.21 (#62)*	The Applicant does not appear to be aware of the relevant amendments to NFPA 855.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Scale of incident and mitigation	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#6), Qu1.1.21 (#63)*	The scale of the maximum possible accident with multi-cabin involvement is so large that the prospect of cabin-to-cabin escalation should be reduced. This should be done by proven prevention measures so that cabin-to-cabin escalation is "functionally impossible".	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Emergency Response Plan	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.22 (#64)*	The BFSMP should have an Emergency Response Plan, taking account of the worst credible accident likely to occur.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Hazardous substances	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.22 (#65)*	Any HSC application would require the Applicant to provide detail of the measure taken / proposed to be taken to limit the consequences of a major accident.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Detail	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions*	It is unclear how the "Rochdale envelope" has been applied to health and safety analysis. Analysis is required for both cells considered for fire, explosion, atmospheric emissions and hazards to the aquatic environment.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.

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	(ExQ1) – Qu1.1.27 (#66 to #68)		
Thermal barriers / location of containers	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.28 (#69 to #78)*	Proposals relating to locations of containers next to one another with thermal barriers is an irresponsible proposal. This is with reference to previous incidents. Blast protection has not been raised because the Applicant has not assessed explosion risk. Even without that, a full scale thermal barrier would need to be proven by extensive modelling and full scale tests. The NFPA 855 recommendation cited needs to be revisited given the evidence of BESS fires lasting for longer than 1-2 hours. Thermal runaway incidents do no require oxygen to develop – heat is sufficient. Free air will have no impact on whether or not a thermal runaway incident affects an adjacent container.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
OBFSMP	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#8), Qu1.1.38 (#79)*	A BESS expert does not agree that the OBFSMP is adequate, inferring that the probability of a major severity impact may not be reduced with the measures proposed.	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.
Unplanned Atmospheric Emissions from BESS (Appendix 16D)	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.50-1.1.63 (#88)*	Appendix 16D has been reviewed unfavourably by experts in the Local Impact Report and an expert for SNTSAG.	This is not accurate. While a number of questions were raised in the LIR by the Council's independent reviewer, these have been addressed. Additionally the following comment was made, indicating the overall acceptance of the report: "Using the "maximum parameters" is a reasonable methodology in the absence of exact data because this will likely represent the worst-case scenario. Once the details of the BESS are known, the assessment must be updated with the expected outcome."

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Toxic gases / hazards	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.4, Qu1.1.50 – 1.1.63 (#90 to #93)*	An expert is quoted as stating that hydrogen fluoride is not the only toxic or dangerous gas that may be emitted during a BESS fire. Reference is also made to gases from a previous explosion. Nickel oxides are potent carcinogens which have been shown to travel large distances in simulated electric vehicle fires. Carbon monoxide is an acute toxic gas known to be generated in Li-ion battery fires and could be a significant contributor to a toxic gas hazard.	The assessment was based on HF as the pollutant most likely to cause harm from a BESS fire. Other pollutants are less likely to be present at distances representative of off-site exposure. A full consequence modelling exercise will be undertaken when the precise chemistry and battery design is known.
Unplanned Atmospheric Emissions from BESS (Appendix 16D)	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#8, #11), Qu1.1.50 – 1.1.63 (#94)*	The modelling exercise undertaken is defective on various grounds: - The accident scenario is wholly arbitrary; - The input data is not credible; - A sensitivity analysis is needed; - The question of what atmospheric conditions should be chosen is beside the point when only one or two scenarios are presented; - The sources cited indicate that there has been no detailed consideration of the research literature. In particular, one of the reports cited has been superseded; - There is little explanation for the origin of the assumed emission rate.	1. The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 [EN010106/APP/8.69] and Written Summary of Applicant's Oral Submissions at the ISH3 [EN010106/APP/8.58] and as such has not been repeated here.
Unplanned Atmospheric Emissions from BESS (Appendix 16D)	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#12), Qu1.1.50 – 1.1.63 (#95 to #104)*	The Appendix 16D model under-states hydrogen fluoride emissions by 71-fold (with reference to the central figure of 2kg hydrogen fluoride). When applied to a more realistic "base case" of total destruction of a cabin of 5MWh, the Appendix	The Applicant considers this issue has been answered within Response to BESS Safety Issues Raised During ISH3 **[EN010106/APP/8.69]** and Written Summary of Applicant's Oral Submissions at the ISH3 **[EN010106/APP/8.58]** and as such has not been repeated here.

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		D results under-state hydrogen fluoride emissions by 500-fold (2kg vs 1000 kg). The Appendix 16D results cannot be reconciled with data and independent plume dispersal models. The input assumptions are not credible against independent analyses and literature data elsewhere. Appendix 16D is simply not credible as a realistic hydrogen fluoride dispersion model.	

2.3 Topic – Client Design

Theme	Deadline and Document Ref	Summary of issue raised	Applicant's response
Detail of design	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Qu1.1.27 (#67)*	Insufficient detail is provided in the application. No appraisal can be started until there is a full specification. This is required under NPS EN-1.	The Applicant does not agree with Dr Fordham's analysis. There is more than sufficient information presented in the Application to enable an assessment to be undertaken. In particular the environmental statement has been prepared for the Application which has assessed a reasonable worst case based on parameters established in the Application. It is correct that a detailed design has not yet been produced and this will not happen until any Development Consent Order is granted. Finalisation of the detailed design is secured by a requirement in the DCO, which requires approval by the relevant planning authority of the detailed design in accordance with documents submitted as part of the DCO Application.

2.4 Topic – Major Accidents

Theme	Deadline and Document Ref	Summary of issue raised	Applicant's response
Hazardous substances / explosions etc.	Deadline 3A – *Comments on Applicant's responses to Examining Authority's First Written Questions (ExQ1) – Summary (#7), Qu1.1.4, Qu1.1.9, Qu1.1.40 and Qu1.1.46 – 1.1.49 (#4, #43, #44, #80 - #86)*	A full appraisal of hazardous substances would have shown the need for a HSC – this is almost certainly a legal requirement. BESS at this scale should be regulated as a COMAH site and in the DCO process a safety assessment by the COMAH CA is required. There should have been early consultation with the COMAH competent authority, which would have indicated the need to consider "loss of control of the processes" under the relevant Regulations. This advice has been ignored. NPS EN-1 envisages in these circumstances the early involvement of the COMAH competent authority i.e. HSE and the EA acting jointly. If one acts alone then that is not acting jointly. The appropriate safety appraisal required at paragraph 4.11.4 of the NPS has not taken place. It is not reasonable to place responsibility for these issues on two local Fire and Rescue Services. Engaging with statutory regulators would produce input from independent experts on e.g. explosion risk, blast protection, air quality, toxic fire water run-off etc. The public is entitled to the protection given by close scrutiny by regulators of detailed plans (particularly given the relative novelty of the technology being deployed at unprecedented scale). The only safety appraisal undertaken is generic and does not appraise a particular proposal. HSE needs to be engaged with what could be one of the largest BESS in the world.	NPS EN-1 sections 4.11 and 4.12 set out the requirements for Safety and Hazardous Substances respectively. Section 4.11.4 states: "*Applicants seeking to develop infrastructure subject to the COMAH regulations should make early contact with the Competent Authority. If a safety report is required it is important to discuss with the Competent Authority the type of information that should be provided at the design and development stage, and what form this should take. This will enable the Competent Authority to review as much information as possible before construction begins, in order to assess whether the inherent features of the design are sufficient to prevent, control and mitigate major accidents. The IPC should be satisfied that an assessment has been done where required and that the Competent Authority has assessed that it meets the safety objectives described above*." Section 4.11.4 does not define exactly when such contact with the Competent Authority should occur, but it is clear that the HSE should be consulted with when it is understood that the development will be subject to The Control of Major Accident Hazards Regulations 2015 (COMAH) Regulations. Section 4.12.1 states "*All establishments wishing to hold stocks of certain hazardous substances above a threshold need Hazardous Substances consent. Applicants should consult the HSE at pre-application stage if the project is likely to need hazardous substances consent. Where hazardous substances consent is applied for, the IPC will consider whether to make an order directing that hazardous substances consent shall be deemed to be granted alongside making an order granting development consent. The IPC should consult HSE about this*." Whilst Section 4.12.1 does state that "*Applicants should consult the HSE at preapplication stage*" this is only where it is known that the project will be likely to need Hazardous Substances Consent (HSC). Under the European Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

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			(CLP), and the associated enabling legislation in the UK, batteries are classified as articles, rather than substances, and are therefore outside of the scope of the COMAH and Hazardous Substances Consent. On 12th July 2021 the Secretary of State for Work And pensions published the following response to a question on whether the exclusion of lithium-ion batteries for grid storage from the Control of Major Accident Hazards Regulations 2015 should be reviewed: "*The Control of Major Accident Hazards Regulations 2015 (COMAH) apply to dangerous substances as classified by the Classification, Labelling and Packaging Regulations 2008. Lithium-ion batteries are considered to be articles, rather than substances, and are therefore outside of the scope of the COMAH.* *The Health and Safety Executive considers that the current regulatory framework is sufficient and suitably robust in relation to lithium-ion batteries and battery energy storage systems.* *Of particular relevance are the Dangerous Substances and Explosive Atmospheres Regulations which set minimum requirements for the protection of workers and others from fire and explosion risks; the Electricity at Work Regulations which require precautions to be taken against the risk of death or personal injury from electricity in work activities; and the Management of Health and Safety at Work Regulations which require risks to be assessed and appropriately managed. In addition, for large scale battery storage, there are statutory requirements to notify the Fire and Rescue Service to inform their emergency response planning.*" This therefore confirms the current position in England and Wales that COMAH and HSC do not apply to batteries as they are not defined as hazardous substances under CLP. COMAH and HSC both require that the foreseeable potential for dangerous substances to be generated by the site activities (including in the event of incidents) should be considered when

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			assessing whether a facility should be regulated as a COMAH establishment or requires HSC. However, the identification of foreseeable events and assessment of the nature of and quantity of hazardous substances generated can only be robustly undertaken once the following information is all available: • Fully developed plant design and layout; • Details on the size of each battery storage unit; • Defined battery technology; • Detailed understanding of the chemical composition of the battery units; • Detailed understanding of the mechanisms by which hazardous substances could be generated; • Detailed understanding of potential event scenarios that could lead to the potential generation of hazardous substances; • Understanding of separation distances between battery storage units and the potential for event propagation between units; This data can then be used as part of a robust risk assessment to provide an understanding of potential hazardous substances that could be generated under foreseeable conditions and the maximum quantities that could be produced under the worst case foreseeable event scenarios. The Scheme is still progressing through the design process, and as yet full detailed design has not yet been completed. As part of this design process, the specific battery technology for the Scheme has not yet been selected, and hence the battery chemistry is not yet defined. Hence it is not yet possible to undertake a robust review of the potential for generation of hazardous substances which can then be used to assess whether COMAH or HSC apply,

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			as stated within the Written Summary of Sunnica Limited's Oral Submissions at the Development Consent Order Issue Specific Hearing on 1 November 2022 **[REP2-036]**. It is therefore proposed that the COMAH and HSC requirements will be reviewed in full at the appropriate point in the Scheme design process. The COMAH Competent Authority will be consulted regarding the adequacy of the risk assessments undertaken and asked to confirm the applicability of COMAH and HSC at the site.