From: Planning Inspectorate
To: Peartree Hill Solar Farm
Subject: FWD: Online system did not allow a submission before deadline 4
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From: [redacted]@live.com>
Date: Thu, Oct 30, 2025 at 3:34 pm
Peartree Hill Solar & BESS Technical & Safety Concerns From: George Swallow, CEng MIChemE To: The Examining Authority, Planning Inspectorate Deadline: 31 October 2025 Reference: Peartree Hill Solar NSIP Application Ref EN010157 Registration reference number F693DA89E Oral submission hearing 23rd October 2025 Introduction Thank you for the opportunity to raise concerns about Battery Energy Storage System (BESS) safety regarding the Peartree Hill Solar & BESS facility - Planning Application Ref EN010157. I am a Chartered Chemical Engineer with professional experience in process-safety and loss-of-containment risk assessment. This written submission follows up my earlier representations and sets out further technical questions and evidence-based concerns regarding the Applicant's BESS proposals. It focuses on: 1. adequacy of the Major Accidents and Disasters (MA&D) assessment; 2. environmental and groundwater protection; 3. compliance with National Fire Chiefs Council (NFCC, 2023) and UK Government (2023) guidance; and 4. verification of safety-instrumented systems and emergency-response provisions. Context from Scientific and Professional Literature Peer-reviewed research by Edwards and Dobson (2024)(Fire Technology, Springer) demonstrates that lithium-ion BESS installations "undoubtedly pose specific and unique hazards in the event of fire" and that "there are no established standards and regulations concerning the safety standards of these large BESS installations." The authors highlight that even so-called "safer" LFP cells can form explosive vapour clouds and fluorinated toxic gases (HF and PFAS) during thermal runaway. They conclude that a pause in UK BESS deployment is warranted until statutory health-and-safety regulations are established [1]. The professional article "Preventing the Next Battery Incident: Rethinking Battery Energy Storage Safety"(The Chemical Engineer, June 2025, Issue 1008) echoes these concerns and calls for unified national standards and mandatory risk-assessment protocols [2]. Summary of Principal Concerns 1. Absence of enforceable regulation: Large-scale BESS installations

currently fall outside statutory regimes such as COMAH; HSE is not a formal consultee [1]. 2. Intrinsic fire and explosion hazard: All Li-ion chemistries carry thermal-runaway risk; LFP cells in particular have high explosion indices [1]. 3. Toxic emissions and contaminated fire-water:Hydrogen fluoride and PFAS compounds have been detected in BESS fire emissions [1]. 4. Groundwater and MATTE risk: Uncontained runoff could pollute sensitive aquifers; the Environment Agency confirmed aquifer sensitivity at ISH2. 5. Operational standards and emergency response:NFCC (2023) requires 6 m container spacing, two access routes, and 1 900 L/min water supply for ≥ 2 h[3]; these have not been demonstrated. Technical Questions for the Applicant 1. Major Accidents and Disasters Assessment (MA&D) Provide the latest MA&D Assessment for the Peartree Hill Solar project. It should apply formal process-safety methods (HAZID, HAZOP, QRA, LOPA, SIL verification) and emergency-planning standards consistent with the RWE Byers Gill Solar precedent (EN010139-000289) [5]. 2. Major Accident to the Environment (MATTE) and Groundwater Risk Confirm that the MA&D includes MATTE scenarios for release of electrolytes, toxic gases, and contaminated fire-water. Edwards and Dobson (2024) identify HF and PFAS generation during such events [1]. Provide a worked containment design calculation (bunds, lagoons, interceptors) sized for NFCC-recommended water-application rates [3]. 3. Aquifer Sensitivity and Environmental Safeguards The Environment Agency confirmed at ISH2 that underlying aquifers are sensitive and used for abstraction. Show how the MA&D and hydrogeology chapters have been revised accordingly, including risk ranking and barrier design to prevent contamination. 4. Safety Instrumented Functions (SIFs) and Independence If the BMS (Battery Management System), thermal sensors, isolation, or suppression systems are credited as safety barriers, confirm that each has been assessed per IEC 61508/61511 (LOPA and SIL determination) and that independence from basic control is demonstrated. The Chemical Engineer (2025) notes that most UK BESS BMS configurations lack verified functional-safety certification [2]. 5. Applicability of Government Guidance Confirm that the project qualifies as a grid-scale installation and complies with the UK Government guidance Health and Safety in Grid-Scale Electrical Energy Storage Systems (DESNZ, 2023) [4]. Provide a section-by-section compliance matrix covering hazard identification, emergency response, and cybersecurity for remote BMS control. 6. NFCC Guidance Compliance Provide a formal design-compliance statement against NFCC (2023) Grid-Scale Battery Energy Storage System Planning – Guidance for FRS [3], including container separation distances, access/egress arrangements, water-supply capacity, and turning-circle geometry. 7. Fire-Water Runoff Management Identify the engineered measures for containing contaminated water (e.g. graded drainage, valves, interceptors, bunded lagoons). Provide capacity sizing based on anticipated application rates and durations, and on potential activation of fixed systems. Edwards and Dobson (2024) highlight that fluorinated compounds and heavy-metal salts in fire-water represent a long-term environmental hazard [1]. 8. Adequacy of Water Supply Demonstrate that hydrant and/or tank supplies meet NFCC requirements (≈ 1 900 L/min for ≥ 2 h). Identify hydrant locations, suction points, and stored water volumes, and confirm that supply remains available under adverse conditions. NFCC (2023) states that insufficient water supply must not dictate suppression-system choice [3]. 9. Access, Egress, and Geometry Provide plans showing two independent access routes allowing for opposing wind directions and sufficient turning circles for FRS appliances. The Outline Battery Safety Management Plan (Appendix 1, Table 1, p. 21) indicates 3 m between BESS units; justify this spacing against the NFCC suggested 6 m minimum or present equivalent engineering mitigations. 10. Design-Basis Data for BESS Containers For each BESS container type, provide manufacturer, model, energy capacity (MWh), cell chemistry, electrolyte inventory, deflagration-vent design, door fire rating, and separation distance used in fire engineering analysis. Cross-reference to general-arrangement drawings.Edwards and Dobson (2024) note that insufficient public transparency regarding BESS design parameters is a recurring safety weakness in UK projects [1]. Additional Evidence and Public-Health Context The UK Health Security Agency raised concerns about the proposed Navenby BESS (2024), stating that non-compliant spacing and lack of runoff containment could “significantly increase the probability of a domino effect (thermal

runaway)" and risk "release of highly toxic fire-water runoff containing heavy metals and corrosive acids into the aquifer." These concerns were reported by the BBC (2024) and remain directly relevant to Peartree Hill [6][7]. The Planning Inspectorate dismissed an appeal and refused planning permission for the Pound Road BESS. The reasoning included that there is a tangible risk that firewater would become contaminated, and subsequently that that firewater would go on to contaminate the water supply, if it were to reach the aquifer. Thus, even though the risk of fire would be low and the risk of firewater becoming contaminated could be very low, the consequences of such an event would be potentially significant to human health. Please consider whether the Peartree Hill submitted proposals demonstrates adequate measures for the containment and removal of contaminated firewater, as potential spreading could contaminate the aquifer, and adversely affect the health of nearby residents [8]. Closing Given the hazards identified in recent peer-reviewed research and official guidance, the Applicant should update and disclose its MA&D and Environmental Risk Assessments to address the points above. All assessments should demonstrate how risks to people, property, groundwater, and the environment are reduced so far as reasonably practicable and how compliance with NFCC and gov.uk guidance is achieved. I request that these revised documents be submitted to the Examining Authority no later than Deadline 5. References & Attachments 1. Edwards P. P. & Dobson P. J. (2024) Remarks on the Safety of Lithium-Ion Batteries for Large-Scale Battery Energy Storage Systems (BESS) in the UK. Fire Technology, Springer, DOI [redacted]. The Chemical Engineer (2025) "Preventing the Next Battery Incident: Rethinking Battery Energy Storage Safety." Issue 1008, June 2025, pages 40 to 43, Institution of Chemical Engineers, London. 3. National Fire Chiefs Council (NFCC) (2023) Grid-Scale Battery Energy Storage System Planning – Guidance for Fire and Rescue Services. NFCC UK. 4. Department for Energy Security and Net Zero (DESNZ) (2023) Health and Safety in Grid-Scale Electrical Energy Storage Systems. Gov.uk Guidance Publication. 5. RWE Renewables UK Swindon Ltd (2023) Byers Gill Solar – Environmental Statement Appendix 2.5: Major Accidents and Disasters Assessment (EN010139-000289). Planning Inspectorate National Infrastructure Planning Library. 6. UK Health Security Agency (UKHSA) (2024) Formal consultation response to the Navenby BESS planning application. 7. BBC News (2024) "'Design Failure' Poses Fire Risk at Battery Site." [redacted] The Planning Inspectorate, A[redacted] Pound Road BESS , [redacted] https://acp.planninginspectorate.gov.uk/ViewDocument.aspx?fileid=63600967