



To  
Marie King (GREAT)  
Andrew Byrne (SBC)

Contact  
Matt Deadman  
Direct line  
01622 692 121 ext 8383  
Email  
matthew.deadman@kentfire-uk.org

Our ref  
Your ref  
Date  
16 January 2024

Dear Maire and Andrew

### Cleve Hill Battery Safety Management Plan

I am writing in response to your emails regarding the above, on the 3<sup>rd</sup> and 9<sup>th</sup> of January respectively.

You were writing in response to Kent Fire and Rescue Service's (KFRS) confirmation to William Allwood (SBC Planning) that we were satisfied with the arrangements laid out by Cleve Hill Solar Park Ltd in their Battery Safety Management Plan (BSMP).

To answer your questions clearly, I have collated them in table form as an addendum to this letter.


I would like to turn to the function of the National Fire Chiefs Council (NFCC) Battery Energy Storage Systems (BESS) guidance. BESS installations are classed as infrastructure. KFRS has no authority to approve or decline planning permission for BESS sites. This decision, in the majority of cases, lies with the Local Authority, or National Infrastructure Planning. KFRS will endeavour to provide consultation during this process, however there is no statutory requirement to do so. The NFCC guidance has been developed as a way of promoting consistency around fire service requirements at BESS sites. It is not a requirement for fire services to provide rigid adherence to the guidance, as each BESS site will be different and therefore should be assessed in its own context. KFRS has had good engagement from Cleve Hill Solar Ltd and has used the NFCC guidance as an initial basis for discussions.


KFRS makes safety issues associated with lithium-ion batteries, including BESS, a high priority. We have spent significant time understanding these issues and, in this case, applying that understanding to the Cleve Hill BESS site. We remain satisfied with the proposals detailed in the Cleve Hill BSMP (December 2023, revision B). Additionally, the review of the BSMP by BST+T provides additional independent scrutiny. I hope this letter provides you with the assurance you need.

Yours Sincerely




Comment	Response
<p>1. Testing</p> <p>Page 4 of the NFCC Guidance states "Details of any evidence-based testing of the system design should be requested". It is not evident in the BSMP that this has been requested or reviewed.</p>	<p>Page 8 (3.7, para 31) details the specifications of the batteries to be used. This includes reference to the compliance standards for the batteries at both cell, module, and container levels. The NFCC guidance makes reference to compliance with UL9540A and this has been confirmed within the BSMP.</p>
<p>2. Design</p> <p>Page 4 of the NFCC Guidelines states "Design features should be made clear." However, the detailed design documentation submitted does not include this level of detail.</p>	<p>The BSMP provides suitable information on page 8 regarding the type of product being installed, size, number of modules and racks, and automatic systems for us to be able to make an informed assessment of the type of installation being proposed.</p>
<p>3. Suppression systems</p> <p>Page 5 of the NFCC Guidelines states "Whilst gaseous suppression systems have been proposed previously, current research indicates the installation of water-based suppression systems for fires involving cell modules is more effective." However, the battery units all include a pre-fitted gaseous suppression system which can only be discharged once, so the common occurrence of subsequent re-ignition would occur in an unprotected unit.</p>	<p>Gaseous suppression systems have become standard on many BESS. There is value in these systems if used to extinguish fires not involving cells (e.g. wiring) and to prevent heat from these fires causing cells to enter thermal runaway. They are not effective on cells in thermal runaway. Our (and the NFCC's) concern lies around the potential to create a delayed vapour cloud explosion that deploying these gaseous systems in the wrong circumstances can have. The system is designed to ensure discharge of the suppression system will only take place in the event of an electrical fire and not a thermal runaway event. There are manual overrides to activate or isolate the system. Additionally, the units are fitted with deflagration venting to NFPA 69 standards to reduce the risk from a vapour cloud explosion. We are satisfied that this system will not adversely affect our chosen fire fighting strategy.</p>

 <span style="font-size: 1.2em; font-weight: bold; margin-left: 10px;">Kent Fire &amp; Rescue Service</span> <span style="font-size: 1.2em; font-weight: bold; margin-left: 10px;">together</span>	
<p><b>4. Site access</b></p> <p>Page 7 of the NFCC Guidelines states:</p> <p>a) "At least 2 separate access points to the site to account for opposite wind conditions/ direction." This has not been included in the design with only one access point available.</p> <p>b) "Roads / hard standing capable of accommodating fire service vehicles in all weather conditions." As you may be aware, the holding area for lorries off the A299 has been closed for a couple of months now as the road surface in there was not capable of supporting HGVs. How can you ensure this will not be the case on site?</p> <p>c) "Turning circles, passing places etc size to be advised by FRS depending on fleet." There is no reference to this in the BSMP or detailed design, nor any detail of passing places etc in the design documentation.</p>	<p>In addition to the main vehicular access gate, the site is provided with pedestrian access gates. In the very unlikely event of us not being able to use the main access gate, we do have the capability of providing a fire fighting capability utilising portable pumps and equipment via the pedestrian access gates.</p> <p>Page 7, para 26 of the BSMP states "Access roads and vehicular access gates have been sized to ensure the largest vehicle required to enter and exit the facility unrestricted post construction. The layout also ensures unrestricted access to the local fire department in a fire event". We will work with Cleve Hill Solar Ltd to ensure this is achieved for our range of fire engines.</p> <p>Having examined the layout of the proposed carriageways within the site, and the layout of the local road network, we do not foresee an issue with access and movement for our vehicles. We have procedures for marshalling our fire engines effectively to ensure that any locations with restricted access are well planned for. We will work with the site throughout to ensure that access is available and we will test these arrangements.</p>
<p><b>5. Access between BESS units and unit spacing</b></p> <p>Page 7 of the NFCC Guidelines states "A standard minimum spacing between units of 6 metres is suggested unless suitable design features can be introduced to reduce that spacing. If reducing distances a clear, evidence based, case for the reduction should be shown." Section 3.3, point 21, of the BSMP includes a distance between battery enclosures and power conversation system blocks of just <math>\geq 3</math> metres, with no evidence that this has been reviewed.</p>	<p>The spacing guidelines in the NFCC guidance relate to distances between BESS units in order to reduce the risk of unit to unit propagation. The BSMP states that distances between these units will be greater than or equal to 6 metres (para 22). This is a requirement that is often challenged by developers and far exceeds other international requirements but which, in this case, we are pleased to have seen Cleve Hill Solar Ltd accept.</p>

 <b>Kent Fire &amp; Rescue Service</b>   together	
<p>6. Distance from BESS units to occupied buildings and site boundaries</p> <p>Page 7 of the NFCC Guidelines states "an initial minimum distance of 25 metres is proposed prior to any mitigation such as blast walls." Section 3.3, point 23 of the BSMP includes a distance of <math>\geq 20</math> metres, with no evidence that this has been reviewed.</p>	<p>Mitigation includes deflagration venting and mechanical fan extraction. These greatly reduce the risk of a vapour cloud explosion. Additionally, the location of the site away from population centres, as well as features like the site bund, reduce the risk considerably. We are satisfied with the distances proposed.</p>
<p>7. Risk Management Plan</p> <p>Page 9 of the NFCC Guidelines states "A Risk Management Plan should be developed by the operator, which provides advice in relation to potential emergency response implications." No such plan has been included with the BSMP.</p>	<p>The BSMP includes emergency response protocols for both during construction (p. 12) and operation (p. 19). Furthermore, the BSMP states that these are the minimum arrangements that will be in place, with further detail being provided once the project's operational teams are appointed. We are satisfied with these arrangements at this stage.</p>
<p>8. Emergency Response Plan</p> <p>Page 9 of the NFCC Guidelines states "An Emergency Response Plan should be developed to facilitate effective and safe emergency response." No such plan has been included with the BSMP.</p>	<p>Much of the information advised within the NFCC guidance document relating to Emergency Response Plans is included elsewhere in the document (for example details of water supplies, suppression systems, site plan, alerting through fire alarm monitoring). We would anticipate gathering additional data through our site-specific risk information process (during construction). We anticipate the site will provide a more detailed emergency response plan once a contractor has been appointed.</p>



 <span style="font-weight: bold;">Kent Fire &amp; Rescue Service</span>   <span style="font-weight: bold;">together</span>	
<p><b>9. Recovery</b></p> <p>Page 10 of the NFCC Guidelines states "The operator should develop a post-incident recovery plan that addresses the potential for reignition of ESS and de-energizing the system, as well as removal and disposal of damaged equipment." No such plan has been included with the BSMP.</p>	<p>Page 23, section 7.3 details the arrangements to be put in place in the event that modules are defective and need to be removed from the site. We would anticipate this would include any modules defective as a result of impacts from a fire. At this stage we are satisfied with the assurances detailed but we will continue to work with Cleve Hill Solar Ltd to refine these arrangements.</p>
<p>Concern has also been raised that a 2 hour water supply is inadequate for the installation proposed in the event of fire, and should be 4 hours minimum.</p>	<p>The NFCC guidance states 1,900 lpm for a minimum of 2 hours. The BSMP states that this will be delivered via on site tanks and a hydrant network. This ensures enough water is immediately available to implement a boundary cooling strategy and confine the fire to the unit of origin. Over the 2-hour period we are able to, should we need, bring in additional water supplies from further afield. There is no requirement for 4 hours in the guidance and we do not feel that there is a need to impose such a requirement.</p>