

OBJECTION.

Bagnall Parish Council has not been formally consulted regarding this application however several Parishioners living close to the site and with very real concerns have drawn the application to our attention.

Our brief review of the submitted documentation noted the following statement:-

Engagement with Staffordshire Fire and Rescue Service

2.4. The Applicant met with the Staffordshire Fire and Rescue Service (SFRS) on the 27th October 2023 to receive advice and recommendations with regards to the safety of the scheme. The main points of discussion from the call included measures outlined within the National Fire Chiefs Council Guidance for BESS (referenced in the NPPG), access, design considerations and also provision of a water connection and drainage features. The level of in-built safety / suppression systems of the BESS equipment was conveyed as the key factor for a proposal's consideration by SFRS with other factors such as access, water supply and drainage systems to be guided by the NFCC guidance proportionally depending on the level of in-built safety / suppression systems of the BESS equipment.

From the above statement we note that the "Consultation" with the Fire Service amounted to no more than a telephone conversation. The liaison document submitted by the applicant goes on to say :-

Safety

4.20. Following engagement with Staffordshire Fire and Rescue Service (SFRS), it was clear that the scheme should be designed for a worst-case scenario to ensure maximum safety.

Response

4.21. The final plans have been shaped by SFRS's advice, as well as the National Fire Chief Council's (NFCC) published guidance.

Bagnall PC response- In relation to the above we make the observation that the design does not follow the recommendations contained in the NFCC document. For instance, taking just one aspect, spacing between battery packs is measured at three metres on the submitted site plan rather than the suggested six metres set out in the NFCC document.

4.22. For instance, it has been ensured that the BESS facility benefits from two unobstructed access points into the compound, with a front access point in the south, and a perimeter road around the facility to allow vehicles to enter/exit from the north if required. In this context the access track provides a circular route around the BESS facility, which will allow for emergency vehicle access. A lay-by is also proposed along the existing farm access track just before Newfields Farm, this will provide a passing place which can be used by emergency vehicles.

Bagnall PC response- We take the view that this statement is somewhat disingenuous. There is only one main access to the site and we note that an internal road runs round the east side of the battery packs which in our opinion does not constitute a "perimeter road" as recommended in the NFCC document. The passing place is outside the site and we suggest has little if any bearing on firefighting on site.

4.23. Furthermore, specific SFRS recommendations have been taken on board so that the scheme features equipment which is designed to reduce risk to the greatest degree possible. The design includes high quality automatic fire detection and suppression systems, as well as fire-resistant materials and sufficient separation distances between equipment in order to contain and restrict the spread of any possible fire. Other design features include sensors which monitor temperature, smoke and gases, plus an aerosol fire suppression system within the BESS cabinets, which will help to contain fire within the cubes. The design of the proposals including the spacing and orientation of the BESS containers has been informed by the manufacture's safety requirements

through their rigorous testing procedures. Further details on this are provided within the Outline Battery Safety Management Plan which accompanies the planning application.

We note the following observation from the Fire Brigade report following the Liverpool BESS fire :-
“Although there was a fire suppression system in the container , the speed of propagation indicated that this hadn’t activated. It was thought that activation would have had little or no effect on the resultant fire/ explosion.”

4.24. Measures to contain fire water in the unlikely event of a fire have also been designed into the development proposals, these include the use of a stop valve on the attenuation tank to stop potentially contaminated water from entering the tank and also the use of an oil interceptor to capture any potential pollutants. These measures have been discussed with SFRS who noted there are several options for containing, capturing and potentially recycling fire water and the Applicant will continue to liaise closely with SFRS as the project moves forward.

Bagnall PC observation - Ex Government Minister Maria Miller in September 2022 stated:- “The only way to stop a battery fire is to cool it down with a constant stream of water and wait for the fire to go out, which might take days, creating huge quantities of water containing highly corrosive hydrofluoric acid and copper oxide- by-products of battery fires”.

4.25. In terms of drainage, the Applicant also made contact with Severn Trent Water. As a result of this, a location was successfully identified for a standard 90mm water connection, which is considered to be sufficient for provision of a suitable fire hydrant. In line with guidance from Severn Trent, the position of the hydrant is proposed within the Site as shown on the Drainage Strategy. This means that it will be easy to access in the unlikely event of a fire and is also in line with recommendations from SFRS in regards for the required distance from the hydrant to the development. Whilst the flow or pressure cannot be guaranteed, SFRS acknowledge that this is a standard limitation for all water companies when it comes to new hydrant connections.

4.26. The Applicant has demonstrated that the development can be delivered in an entirely safe manner and crucially in the unlikely event of a fire there are several measures proposed to prevent thermal runaway and spread, allowing any event to be quickly isolated. The Applicant is happy to have continued discussions with the Council and SFRS to deliver the necessary safety measures required.

Bagnall PC observation- We note that the recommended guideline for volume of available water and pressure at the hydrant supply is not stated and is not guaranteed by STWA.

We note the initial response from Staffordshire Fire and Rescue attached to the planning documentation which states:-

There have already been a number of high-profile incidents involving BESS sites and learning from these incidents continues to emerge.

SFRS’s expectation is that a comprehensive risk management process must be undertaken by operators to identify hazards and risks specific to the facility and develop, implement, maintain and review risk controls. From this process a robust Emergency Response Plan should be developed.

They go on to state :- *Following guidance produced by the National Fire Chiefs Council (NFCC) Grid scale Battery Energy Storage System Planning, SFRS require detailed evidence regarding:*

System design and construction

Information required:

1. The battery chemistries being proposed (e.g. Lithium-ion Phosphate (LFP), Lithium Nickel Manganese Cobalt Oxide (NMC)). Because:

- a. Battery chemistries will directly affect the heat released when a cell goes into thermal runaway.*
- b. Battery chemistries will influence vapour cloud formation.*
- c. An understanding of the battery chemistry is useful when requesting scientific advice during an incident.*

2. The battery form factor (e.g. cylindrical, pouch, prismatic)
3. Type of BESS e.g. container or cabinet
4. Number of BESS containers/cabinets
5. Size/capacity of each BESS unit (typically in MWh)
6. How the BESS units will be laid out relative to one another.
7. A diagram / plan of the site.
8. Evidence that site geography has been considered (e.g. prevailing wind conditions).
9. Access to, and within, the site for FRS assets
10. Details of any fire-resisting design features
11. Details of any:
 - a. Fire suppression systems
 - b. On site water supplies (e.g. hydrants, EWS etc)
 - c. Smoke or fire detection systems (including how these are communicated)
 - d. Gas and/or specific electrolyte vapour detection systems
 - e. Temperature management systems
 - f. Ventilation systems
 - g. Exhaust systems
 - h. Deflagration venting systems
12. Identification of any surrounding communities, sites, and infrastructure that may be impacted as a result of an incident.

Testing

Details of any evidence-based testing of the system design should be provided, for example, results of UL 9540A testing.

Design

Design features should be made clear. These may include:

- * Rack layout and setup
- * Thermal barriers and insulation
- * Container layout and access arrangements

Detection and monitoring

An effective and appropriate method of early detection of a fault within the batteries should be in place, with immediate disconnection of the affected battery/batteries. This may be achieved automatically through the provision of an effective Battery Management System (BMS) and/or a specific electrolyte vapour detection system.

Should thermal runaway conditions be detected then there should be the facility in place for the early alerting of emergency services.

Detection systems should also be in place for alerting to other fires that do not involve thermal runaway (for example, fires involving electrical wiring).

Continuous combustible gas monitoring within units should be provided. Gas detectors should alarm at the presence of flammable gas, shut down the ESS, and cause the switchover to full exhaust of the ventilation system. Sensor location should be appropriate for the type of gas detected e.g. hydrogen, carbon monoxide, volatile organic compounds. External audible and visual warning devices (such as cabinet level strobing lights), as well as addressable identification at control and indicating equipment, should be linked to:

1. Battery Management System (when a thermal runaway event is identified)
2. Detection and suppression system activation

Suppression systems

Suitable fixed suppression systems should be installed in units in order to help prevent or limit propagation between modules.

Where it is suggested that suppression systems are not required in the design, this choice should be supported by an evidence-based justification and Emergency Response Plan that is designed with this approach in mind (for example, risk assessed controlled burn strategies, and external sprinkler systems).

Deflagration Prevention and Venting

BESS containers should be fitted with deflagration venting and explosion protection appropriate to the hazard. Designs should be developed by competent persons, with design suitability able to be evidenced. Exhaust systems designed to prevent deflagration should keep the environment below 25% of Lower Explosive Limit (LEL).

Flames and materials discharged as a result of any venting should be directed outside to a safe location and should not contribute to any further fire propagation beyond the unit involved or present further risk to persons. The likely path of any vented gasses or materials should be identified in Emergency Response Plans to reduce risk to responders.

Explosion/deflagration strategies should be built into the emergency plan such that responders are aware of their presence and the impact of their actions on these strategies. Where emergency ventilation is used to mitigate an explosion hazard, the disconnect for the ventilation system should be clearly marked to notify personnel or first responders to not disconnect the power supply to the ventilation system during an evolving incident.

Site access

Suitable facilities for safely accessing and egressing the site should be provided. Designs should be developed in close liaison with the local FRS as specific requirements may apply due to variations in vehicles and equipment.

This should include:

** At least 2 separate access points to the site to account for opposite wind conditions/direction.*

** Roads/hard standing capable of accommodating fire service vehicles in all weather conditions. As such there should be no extremes of grade.*

** A perimeter road or roads with passing places suitable for fire service vehicles.*

** Road networks on sites must enable unobstructed access to all areas of the facility.*

** Turning circles, passing places etc size to be advised by FRS depending on fleet.*

Access between BESS units and unit spacing

In the event of a fire involving a BESS unit, one of the primary tactics employed will be to prevent further unit to unit fire spread. Suitable access for firefighters to operate unimpeded between units will therefore be required. This should allow for the laying and movement of hose lines and, as such, access should be free of restrictions and obstacles. The presence of High Voltage DC Electrical Systems is a risk and their location should be identified. Exclusion zones should be identified.

A standard minimum spacing between units of 6m 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.

Any reduction in this separation distance should be design based by a competent fire engineer.

There should be consideration for the fire separation internally and the total realistic load of fire.

Proposed distances should be based on radiant heat flux (output) as an ignition source.

SFRS does not support the stacking of containers/units on top of one another on the basis of the level of risk in relation to fire loading, potential fire spread, and restrictions on access.

Distance from BESS units to occupied buildings & site boundaries

Individual site designs will mean that distances between BESS units and occupied buildings/site boundaries will vary. Proposed distances should consider risk and mitigation factors. However, an initial minimum distance of 25m is proposed prior to any mitigation such as blast walls. Reduction of distances may be possible in areas of lower risk (e.g. rural settings). Where possible buildings should be located upwind.

Site Conditions

Sites should be maintained in order that, in the event of fire, the risk of propagation between units is reduced. This will include ensuring that combustibles are not stored adjacent to units and access is clear and maintained. Areas within 10 metres of BESS units should be cleared of combustible vegetation and any other vegetation on site should be kept in a condition such that they do not increase the risk of fire on site. Areas with wildfire risk or vegetation that would result in significant size fires should be factored into this assessment and additional cleared distances maintained as required.

Water Supplies

Water supplies will depend on the size of the installation. In the majority of cases, initial firefighting intervention will focus on defensive firefighting measures to prevent fire spread to adjacent containers. As a result, proposals for water supplies on site should be developed following liaison with the local fire and rescue service. This should also take account of the ability of/anticipated time for the fire and rescue service to bring larger volumes of water to site.

As a minimum, it is recommended that hydrant supplies for boundary cooling purposes should be located close to BESS containers (but considering safe access in the event of a fire) and should be capable of delivering no less than 1,900 litres per minute for at least 2 hours. SFRS may wish to increase this requirement dependant on location and our ability to bring supplementary supplies to site in a timely fashion.

Water supply for any automatic suppression system will be covered by the relevant standard/ design depending on which system chosen as appropriate for the risk.

Any static water storage tanks designed to be used for firefighting must be located at least 10m away from any BESS container/cabinet. They must be clearly marked with appropriate signage. They must be easily accessible to SFRS vehicles and their siting should be considered as part of a risk assessed approach that considers potential fire development / impacts. Outlets and connections should be agreed with SFRS. Any outlets and hard suction points should be protected from mechanical damage (e.g. through use of bollards). Consideration should be given, within the site design, to the management of water run-off (e.g. drainage systems, interceptors, bunded lagoons etc).

Signage

Signage should be installed in a suitable and visible location on the outside of BESS units identifying the presence of a BESS system. Signage should also include details of:

- * Relevant hazards posed*
- *The type of technology associated with the BESS*
- * Any suppression system fitted*
- * 24/7 Emergency Contact Information*

Signs on the exterior of a building or enclosure should be sized such that at least one sign is legible at night at a distance of 30m or from the site boundary, whichever is closer.

Adherence to the Dangerous Substances (Notification and Marking of Sites) Regulations 1990 (NAMOS) should be considered where the total quantity of dangerous substances exceeded 25 tonnes.

Emergency Plans

Site operators should develop emergency plans and share these with the Fire and Rescue Service. These include:

A Risk Management Plan should be developed by the operator, which provides advice in relation to potential emergency response implications including:

- *The hazards and risks at and to the facility and their proposed management.*
- *Any safety issues for firefighters responding to emergencies at the facility.*
- *Safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems.*
- *The adequacy of proposed fire detection and suppression systems (eg., water supply) on-site.*
- *Natural and built infrastructure and on-site processes that may impact or delay effective emergency response.*

An Emergency Response Plan should be developed to facilitate effective and safe emergency response and should include:

- *How the fire service will be alerted.*
- *A facility description, including infrastructure details, operations, number of personnel, and operating hours.*
- * A site plan depicting key infrastructure: site access points and internal roads; firefighting facilities (water tanks, pumps, booster systems, fire hydrants, fire hose reels etc); drainage; and neighbouring properties.*

Details of emergency resources, including fire detection and suppression systems and equipment; gas detection; emergency eye-wash and shower facilities; spill containment systems and equipment; emergency warning systems; communication systems; personal protective equipment; first aid.

**Up-to-date contact details for facility personnel, and any relevant off-site personnel that could provide technical support during an emergency.*

** A list of dangerous goods stored on site.*

** Site evacuation procedures.*

** Emergency procedures for all credible hazards and risks, including building, infrastructure and vehicle fire, grassfire and wildfire.*

Environmental impacts

Suitable environmental protection measures should be provided. This should include systems for containing and managing water runoff. System capability/capacity should be based on anticipated water application rates, including the impact of water based fixed suppression systems.

Sites located in flood zones should have details of flood protection or mitigation measures.

Recovery

The operator should develop a post-incident recovery plan that addresses the potential for re-ignition of ESS and de-energizing the system, as well as removal and disposal of damaged equipment.

From the documentation attached to the application it would appear that the detailed review by Staffordshire Fire and Rescue has not yet taken place/ been received by SMDC. In view of the clear deviation of the submitted application from the NFCC guidelines Bagnall Parish Council consider that it would be inappropriate for the application to be considered further until such time as the consultation/ review of the proposed development has been completed by Staffordshire Fire and Rescue.

Andrew Batson
Vice Chair Bagnall Parish Council