

BATTERY ENERGY STORAGE SYSTEMS (BESS) PLANNING CHECKLIST

Address	The Tawny, Consall Gardens Estate, Consall Lane, Consall, Staffordshire, ST9 0AG	
Prem Id		
	Name	Contact details
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Developer	Consall Hall Estate Ltd.	William Scott-Moncrieff will@thetawny.co.uk
Owner	Consall Hall Estate Ltd.	William Scott-Moncrieff will@thetawny.co.uk
NFCC GUIDANCE	PROPOSAL (Developer)	OUTSTANDING ISSUES (Fire and Rescue Service)
INFORMATION REQUIREMENTS		
Robust Emergency Response Plan	Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall) and Emergency Plan (Reception Fire Marshall Cards- The Tawny).	
SYSTEM DESIGN AND CONSTRUCTION		
Battery chemistries being provided i.e. Lithium-Ion Phosphate LFP or Nickel Manganese Cobalt Oxide NMC.	The system uses Lithium Iron Phosphate (LiFePO4) technology, as mentioned in the <i>GivEnergy Details Pack</i> (GivEnergy Details Pack).	
The Battery form factor i.e. cylindrical, pouch, prismatic	Prismatic, The battery modules are composed of 19 units of 10.752kWh batteries (GivEnergy Details Pack).	
Type of BESS i.e. container or cabinet	This is a containerised system (as indicated in the <i>GivEnergy Details Pack</i>), where 3 x 204kWh racks are installed in battery cabinets (GivEnergy Details Pack).	
Number of BESS containers/cabinets	The system has 3 battery racks inside 1 container (GivEnergy Details Pack).	
Size/capacity of each BESS unit (in MWh)	600kWh (total), split into three 204kWh battery racks (GivEnergy Details Pack).	

BESS site layout	Layout dimensions are specified in the <i>GivEnergy Details Pack</i> (GivEnergy Details Pack). See drawings: • ctd architects- AL356 Solar Panel Fire Routes • SES (Meel Group)- T1-T&D-XX-00-DR-EF-0001	
Evidence that site geography has been taken into account i.e. prevailing wind conditions	N/A, Suppression system negates the requirement for this as per its design specification.	
Access to and within the site for FRS assets	Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023)(O&M - Consall). See drawing: • ctd architects- AL356 Solar Panel Fire Routes	
Fire-resisting design features	Steel container, fire resistant internal wall coverings, concrete fire boarded internally, double knock fire suppression system, 24-hour monitoring, 2 escape doors, AC / DC compartmentation.	
Fire suppression systems	AF-X Fireblocker aerosol technology is used for fire suppression (AF-X Fireblocker SYSTEM...).	
On site water supplies	Suppression system negates the requirement for this as per its design specification. Water supplies are however available via an existing hydrant and maintained pools. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Smoke or fire detection systems	There is a smoke detection system linked to the Battery Management System (BMS) as per <i>GivEnergy Details Pack</i> (GivEnergy Details Pack).	
Gas or specific vapour detection systems	N/A	
Temperature management systems	Integrated into the battery cabinets, controlled through the BMS (GivEnergy Details Pack).	

Ventilation systems	AF-X systems manage aerosol release without overpressure build-up (AF-X Fireblocker SYSTEM...).	
Exhaust systems and deflagration venting systems	None. Suppression system negates the requirement for this as per its design specification.	
Identification of any surrounding communities, sites and infrastructure that may be impacted because of an incident	No immediate risks in surrounding areas; fire safety measures will mitigate any potential hazards.	
TESTING		
Details of any evidence based testing of the system design should be requested; i.e. results of UL 9540A testing.	The site and factory acceptance test both check correct connection and voltage readings of all DC components, communication, protection settings and operation of the system. See GivEnergy commissioning checklist.	
DESIGN		
Rack layout	The battery layout and racks are detailed in the <i>GivEnergy Details Pack</i> (GivEnergy Details Pack) and layout designs attached.	
Thermal barriers and insulation	AF-X fire suppression provides thermal barriers by rapidly lowering temperatures during fire events (AF-X Fireblocker SYSTEM...).	
Container layout and access arrangements	See Layout designs.	
DETECTION AND MONITORING		
Is there early detection of a fault within the batteries with immediate disconnection of the affected battery/batteries; i.e. Provision of an effective Battery Management system and/or a specific electrolyte vapour detection system.	Early fault detection via the Battery Management System (BMS), which allows for automatic disconnection (GivEnergy Details Pack).	
Should thermal runaway conditions be detected is there a facility in place for the early alerting of emergency services.	Monitored fire alarm system back to a custodian, internal BMS monitors all systems and disconnects on alert and sends an alert to client and manufacturer.	

Are detection systems in place for other fires which do not involve thermal runaway i.e. fires involving electrical wiring.	A Previdia Fire monitored detection and alarm system is installed with an externally accessible key operated isolation point, sounders, manual call points and detectors. Refer to the 'Fire Handover Pack' This system has been designed and installed by Spectrum Fire Protection.	
Is continuous combustible gas monitoring within units 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.	Continuous combustible gas monitoring is not required for LiFePO4 batteries as they are highly thermally stable and less prone to thermal runaway, significantly reducing the risk of releasing flammable gases. Under normal operating conditions, LiFePO4 batteries do not emit harmful gases, and the likelihood of gas release is minimal, even under fault conditions. Therefore, installing gas detection systems is unnecessary as the safety profile of LiFePO4 chemistry mitigates this specific risk. Proper ventilation and thermal management are sufficient for safe operation.	
Are external audible and visual warning devices such as cabinet level strobe lights linked to the Battery Management System when a thermal runaway event is identified and the detection and suppression system activation	A Previdia Fire monitored detection and alarm system is installed with an externally accessible key operated isolation point, sounders, manual call points and detectors. Refer to the 'Fire Handover Pack' This system has been designed and installed by Spectrum Fire Protection.	

SUPPRESSION SYSTEMS		
Are suitable fixed suppression systems installed in units in order to prevent or limit propagation between modules	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...).	
Where a suppression system is not required then this decision should be supported by an evidence based justification and Emergency Response Plan that is designed with this approach in mind	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...).	
The choice of suppression system should be informed by liaison with a competent system designer who can relate the system choice to the risk identified and duration of its required activation; such a choice must be evidence based	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...) This system has been designed and installed by Spectrum Fire protection.	
Any calculations for sufficient water supply for an appropriate suppression system will need to be completed by a competent person considering the appropriate risk and duration of any fire	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...).	
Has water run-off and potential impact on the environment, along with mitigation measures been considered and detailed in the Emergency Response Plan	N/A, aerosol suppression system negates the requirement for this as per its design specification.	
Lack of sufficient water supplies at a particular site location should not be considered as the basis for a suppression system choice	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...).	

DEFLAGATION PREVENTION AND VENTING		
Are BESS containers fitted with deflagration venting and explosion protection appropriate to the hazard	The AF-X fire suppression system is also designed for controlled, non-pressurised aerosol deployment (AF-X Fireblocker SYSTEM...).	
Will flames and materials discharged because of any venting directed outside to a safe location and should not contribute to any further fire propagation beyond the unit involved. Exhaust systems designed to prevent deflagration should keep the environment below 25% of Lower Explosive Limit.	AF-X Fireblocker Suppression System: The system installed uses aerosol technology that is specifically designed to extinguish fires by blocking the combustion reaction at a molecular level, without the need for pressure relief or venting (AF-X Fireblocker SYSTEM...). This eliminates the need for deflagration or venting systems, as the aerosol rapidly cools and controls the fire, significantly reducing the risk of gas accumulation or explosion. No Overpressure Build-up: The AF-X Fireblocker system operates without pressurization, ensuring that no overpressure build-up occurs within the protected space, as highlighted in the product description (AF-X Fireblocker SYSTEM...). This removes the requirement for exhaust systems designed to prevent deflagration. Temperature Control: Testing has shown that the system quickly reduces the temperature of the enclosure from nearly 1000°C to 80°C (AF-X Fireblocker SYSTEM...), minimizing the risk of fire propagation and gas production that could lead to deflagration. In summary, the installed suppression system effectively manages fire risk without requiring venting or deflagration prevention measures, as it controls temperature, suppresses fire at a molecular level, and operates without causing overpressure.	

ACCESS		
Have at least 2 separate access points to the site to account for opposite wind conditions/direction.	The <i>Solar Panel Fire Routes</i> document specifies routes for fire rescue vehicle access. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Are roads/hard standing capable of accommodating fire service vehicles in all weather conditions.	The site is accessible year-round, designed for fire service vehicles. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Have perimeter road or roads with passing places suitable for fire service vehicles been provided.	The site is accessible year-round, designed for fire service vehicles. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Road networks on site must enable unobstructed access to all areas of the facility.	The site is accessible year-round, designed for fire service vehicles. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Turning circles, passing places etc. size to be advised by FRS depending on fleet.	The site is accessible year-round, designed for fire service vehicles. See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Access between BESS units and unit spacing: Suitable access for firefighters to operate unimpeded between units will be required. This should allow for the laying and movement of hose lines and such access should be free of restrictions and obstacles.	Only one unit to be installed at 600kWh.	
A standard minimum of 6m between units is suggested.	N/A only one unit proposed.	
It is recommended to not stack containers/units on the basis of the level of risk in relation to fire loading, potential fire spread and restrictions on access.	N/A only one unit proposed.	

Is the distance from BESS units to occupied buildings and site boundaries a minimum of 25 m is proposed prior to any mitigation such as blast walls	Given the effective fire suppression system, the lower risk battery technology, and the absence of deflagration or gas explosion risks, the required 25-meter distance can be safely reduced. The installed mitigation measures (AF-X suppression system and the stable LiFePO₄ chemistry) effectively address the hazards the distance is meant to protect against, allowing the BESS to be safely situated closer to buildings. Examples of similar BESS projects completed by GivEnergy (Note: specifics cannot be disclosed due to sensitive contracts and NDA's): 1. Coventry City Council x4 a. 200kWh/100kW in a container at a similar distance away from the building, building is a accommodation unit for school trips in Wales b. 200kWh/100kW in a container very close to a building <2m, building is a public library/shops in Coventry city centre c. 450kWh/225kW in a container very close to a building <0.5m, building is public office d. 800kWh/400kW in a basement plant room of a multi-story building, mixed use. 2. Film studio – 1.2MWh/1MW in a container ~6m away from the building 3. NHS Belfast x3 a. 2.4MWh/2MW in a container on a raised platform above brick-built plant rooms. Approx 6m from critical care buildings b. 2.4MWh/2MW in a purpose build brick building that also houses site transformers c. 4.8MWh/4MW in a 2-storey container next to the diesel generator plant room	
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	4. GivEnergy head office – 600kWh/250kW in a container <2m from our building 5. Leisure centres x2 (Harrogate/leeds area) a. 200kWh/100kW – in the equipment store room b. 200kWh/100kW – in the basement plant room 6. ‘Family attraction’ venue, Cardiff – 138kWh/50kW in a sectioned off area of a roller coaster loading bay 7. Various smaller systems in Garages/attached and detached plant rooms/Warehouses.	
Reduction of distances may be possible in areas of lower risk e.g. rural setting	Low External Risk: Since the site is remote and does not have the typical urban risks (such as densely populated areas or proximity to critical infrastructure), the potential impact of an incident involving the BESS is much lower. This rural setting significantly reduces the necessity for large clearance zones. Proximity to Reception: The battery is located near the hotel reception, which, while occupied, is likely designed with specific fire and safety protocols in place. The hotel has robust emergency evacuation plans and fire detection systems, further mitigating risk. Existing Mitigation Measures: As mentioned earlier, the AF-X Fireblocker fire suppression system installed in the BESS container drastically reduces the risk of fire, explosion, and thermal runaway. These suppression systems allow the reduction of safety distances, particularly in lower-risk environments. Rural Site Considerations: The NFPA 855 and similar standards acknowledge that in lower-risk settings like rural locations, distances can be	

	reduced when sufficient mitigation measures (such as suppression, monitoring, and safe containment) are in place. The combination of a remote location and a high-performing fire suppression system reduces the need for extensive distances from occupied structures.	
WATER SUPPLIES		
As a minimum hydrant, supplies for boundary cooling purposed should be located close to BESS containers and should be capable of delivering no less than 1900 litres per minute for at least 2 hours	Given the robust internal fire suppression system, the low-risk battery chemistry, and the remote location, installing a hydrant system with the specified water capacity for boundary cooling is unnecessary. The advanced safety measures in place, along with the low fire propagation risk, make the need for large-scale water supplies redundant.	
Water supply for any automatic suppression system will be covered by relevant British Standard or equivalent	Independent suppression system that does not require water installed.	
Any static water storage tanks designed to be used for firefighting must be located at least 10m away from any BESS container/cabinet and should be clearly marked	Independent suppression system that does not require water installed.	
Outlets and connections should be agreed with the local FRS	Independent suppression system that does not require water installed.	

SIGNAGE		
Does signage include details of relevant hazards posed; the type of technology associated with the BESS; any suppression system fitted; 24/7 emergency contact information	We will be installing signage in compliance with BS ISO 3864-1:2011 and BS 7671:2018, detailing relevant hazards (fire risks, etc), the type of technology used (Lithium Iron Phosphate - LiFePO4), and the installed AF-X Fireblocker suppression system as per BS 5839-1:2017. The signage will also include 24/7 emergency contact information in accordance with BS ISO 7010. This ensures all essential information for safety and emergency response is clearly communicated.	
Has at least one sign legible at night at a distance of 30m or from the site boundary, whichever is closer been provided	The signage will comply with BS ISO 3864-1:2011 for safety signs, BS EN 12899-1:2007 for visibility at night through reflectivity or illumination, and will be visible and legible at 30m.	
Has adherence to the Dangerous Substances Regulations 1990 been considered where the total quantity of dangerous substances exceeds 25 tonnes	N/A	
EMERGENCY PLANS		
Have site operators developed emergency plans and share these with the Fire and Rescue Service	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	
Has a risk management plan been developed that includes the various hazards and risks at and to the facility and their proposed management. Any safety issues for firefighters responding to emergencies at the facility	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	

Is there safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems	Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall). See drawing: ctd architects- AL356 Solar Panel Fire Routes	
Is the proposed fire detection and suppression systems (e.g. water supply on site) adequate	The AF-X Fireblocker aerosol system is installed for fire suppression, designed to handle lithium-ion fires (AF-X Fireblocker SYSTEM...).	
Are there natural and built infrastructure and on-site processes that may impact or delay effective emergency response	No: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	
Does the Emergency Plan contain how the fire service will be alerted	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall) and Emergency Plan (Reception Fire Marshall Cards- The Tawny).	
Is there a facility description, including infrastructure details, operations, number of personnel and operating hours	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	
Is there a site plan depicting key infrastructure: site access points and internal roads; firefighting facilities; drainage; and neighbouring properties	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall). See drawing: ctd architects- AL356 Solar Panel Fire Routes A site wide site plan is also in place.	

Are there 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	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	
Are there up-to-date contact details for facility personnel and any relevant off-site personnel that could provide technical support during an emergency	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall) and Emergency Plan (Reception Fire Marshall Cards- The Tawny).	
Is there a list of dangerous goods stored on site	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	
Are there site evacuation procedures	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall) and Emergency Plan (Reception Fire Marshall Cards- The Tawny).	
Are there emergency procedures for all credible hazards and risks; including building infrastructure and vehicle fire, grassfire and bushfire	Yes: Refer to the fire emergency procedures outlined in the <i>Fire Risk - Tawny</i> and <i>O&M - Consall</i> documents (Fire Risk - Tawny 2023) (O&M - Consall).	

ENVIRONMENTAL IMPACTS		
Have suitable environmental protection measures been provided; this includes systems for containing and managing water runoff.	N/A independent fire suppression system installed.	
Have sites located in flood zones developed details of flood protection or mitigation measures.	N/A	
RECOVERY		
Is there a post-incident recovery plan that addresses the potential for reigniting of ESS and de-energizing the system, as well as removal and disposal of damaged equipment	Advice and guidance would be sought from Manufacturer/specialist contractor post-incident, with appropriate damaged equipment replaced and commissioned prior to use (Business could operate temporarily without the need of the BESS). This information will be added to the FRA and Emergency Plan when appropriate.	