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BESS STANDARDS

...THOUGHTS ON WHAT WE SHOULD BE REQUIRING

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Proposal: Standard for Battery Energy Storage Systems (BESS)

Foreword

This document outlines a proposed draft standard for Battery Energy Storage Systems (BESS) currently in operation or under development across the United Kingdom. There is growing concern that existing UK regulations inadequately address the safety and environmental risks associated with BESS installations, especially in the context of government risk management policies. Numerous international incidents have demonstrated that BESS installations pose significant risks to human life, animal welfare, and the environment.

It is important to note that the enactment of the Regulatory Reform (Fire Safety) Order 2005 resulted in the repeal of numerous fire safety provisions, including locally enacted legislation that previously mandated fire authority consultation during planning applications. This shift has contributed to a systemic erosion of fire safety standards, as evidenced by investigations into major incidents such as the Grenfell Tower fire. These regulatory changes were ostensibly designed to streamline development but have had the effect of weakening public protections and undermining emergency service preparedness.

1. Site Access Requirements

Safe and reliable access is essential for both the construction and maintenance of BESS sites. Equally critical is the provision of secure and unobstructed access for emergency responders. This section outlines minimum access requirements.

- - Access Points: Each site shall have at least two access points for emergency services. The primary access should be oriented in line with the prevailing wind direction. A secondary access point shall be situated $180^{\circ} \pm 20^{\circ}$ from the primary access to account for variable wind conditions.
- - Access Control: All access points must incorporate secure entry mechanisms operable by emergency services. Clearly marked, weatherproof containers with essential documentation (site plans, isolation protocols, risk assessments, water supply maps, detection panel locations, etc.) must be installed at each entrance.
- - Wind Monitoring: Each site must be equipped with a visible windsock and an electronic wind direction indicator. Wind data must be relayed in real-time to the control center and shared with emergency services during incidents.
- - Internal Roadways: A continuous internal road must connect both access points, allowing emergency vehicles to enter and exit without reversing. Roads shall be a minimum of 5.5 m wide and capable of supporting a 25-tonne fire appliance.

- - Turning Facilities: Adequate turning circles or junctions shall be provided within the site to enable large vehicles to maneuver safely.
- - Rendezvous Points: Dedicated rendezvous locations must be established in consultation with emergency services for marshalling and initial response coordination.

2. Placement and Spacing of BESS Units

- - Unit Separation: A minimum separation of 6 metres shall be maintained between units. This distance may be reduced to 3 metres where an effective fire spread mitigation system (e.g., water curtain) is implemented and approved by the local fire authority.
- - Exclusion Zones:
 - No unit shall be sited within 5 miles of a town or village.
 - A minimum distance of 1 mile shall be maintained from any residential property.
 - A buffer of 10 miles shall be observed from any school, educational institution, or medical facility.
- - Explosion Relief & Detection:
 - All units shall be equipped with explosion relief vents at high level.
 - Fire detection systems must be capable of identifying thermal runaway through off-gassing indicators.
 - Each battery module must include temperature sensors that trigger alarms if the rate of temperature rise exceeds 10°C/minute or if the temperature exceeds 60°C.
- - Suppression Systems: A fire suppression system must be installed at the module level. Although suppression will not prevent a thermal event, it may delay its escalation. Provisions must be made, in consultation with emergency services, for the remote injection of water mist into affected units from a minimum distance of 10 meters.

3. Ground Stability and Environmental Suitability

- - No BESS facility shall be established on land with a known history of subsidence.
- - All planning applications must include a detailed geotechnical survey conducted by a competent authority.
- - The local authority must be consulted during site selection and development.

Certainly — here is a more formal and technical version of your text:

4. Flood Risk Management

- Battery Energy Storage System (BESS) facilities shall not be sited on land with a documented history of flooding or within areas designated as high flood risk zones by relevant authorities.
- All planning applications for BESS installations must be accompanied by a comprehensive Flood Risk Assessment (FRA), prepared and certified by a qualified and accredited professional in accordance with national and local regulatory requirements.
- The local planning authority shall be formally consulted during the site selection and development phases to ensure compliance with flood risk mitigation policies and land-use planning regulations.

5. Communication Systems

- - Each site must have a minimum of two independent communication systems (e.g., fibre optic, cellular, satellite) to ensure continuity of operations in the event of failure.
- - In case of an incident, the site control center must provide emergency services with complete details including:
 - Wind direction
 - Recommended access route
 - Specific unit information
 - Type and severity of alarm

6. Emergency Planning and Compliance

- - The operator must adopt and implement emergency protocols aligned with the Control of Major Accident Hazards (COMAH) Regulations 2015, or the prevailing national equivalent.
- - Emergency response plans must be developed in coordination with the following agencies:
 - Fire and Rescue Service
 - Police
 - Ambulance Service
 - NHS and relevant Health Authorities
 - Local Authority

- - Gas monitoring equipment must be made available within two hours of request to monitor areas up to a 12 km radius.
- - A certified hazardous waste cleanup contractor must be retained to manage the decontamination and removal of damaged units within the same radius.
- - Any defective battery module must be isolated and placed in a secure, water-fillable containment unit and removed from the site within 48 hours, in accordance with Carriage of Dangerous Goods (CDG) Regulations.
- - The operator shall maintain a fund or insurance policy, as agreed with local authorities, to provide:
 - Emergency housing and welfare for evacuated individuals or animals within a 12 km radius
 - Compensation for affected parties
 - Personal financial guarantees by directors in the event of corporate insolvency

7. Water Supply and Firefighting Infrastructure

- - Hydrants shall be installed:
 - Externally at each access point, with precise distances approved by the fire service
 - Internally, in locations approved during the emergency planning process
- - Hydrant Specification:
 - Pillar type with two female instantaneous couplings and one 100 mm screw thread for suction
 - Below-ground isolation valves and automatic drainage to prevent freezing
- - Flow Rate: Minimum 2000 L/min via mains or dedicated pump-fed emergency supply, per fire service specifications.

8. Environmental Safeguards

- - A detailed environmental risk assessment must be completed prior to site approval.
- - Measures must be in place to prevent firewater runoff from contaminating:
 - Natural watercourses
 - Sites of Special Scientific Interest (SSSIs)
 - Groundwater supplies used for drinking water

- - The relevant environmental regulator shall determine appropriate environmental protection measures, which must be implemented before site commissioning.

9. Required Stakeholder Engagement

All planning and modification applications must include formal consultation with the following organizations:

- - Local Fire and Rescue Service
- - Local Police Authority
- - NHS / Health Authority
- - Ambulance Service
- - Environment Agency (or equivalent)
- - Local Planning Authority
- - National Highways (if applicable within a 12 km radius)