Battery Energy Storage Systems

Document number (AP003/PS005)

Next Review Due 31/03/2029

1. Purpose

Hampshire and Isle of Wight Fire and Rescue Authority (HIWFRA) is committed to ensuring that Hampshire and the Isle of Wight have an efficient and effective fire and rescue service which makes life safer for everyone.

This is HIWFRA's Position Statement for Battery Energy Storage Systems (BESS) and forms part of the HIWFRA's Protection Policy.

2. Authority's Position

Battery Energy Storage Systems (BESS) is technology designed to store large amounts of electrical energy in batteries for later use. BESS is an increasing technology as society explores alternatives to traditional energy supply and use of renewal energy systems.

BESS typically house many batteries together on a rack, combined with monitoring and management units. These systems have a small footprint for the energy they store.

Lithium-ion (Li-ion) batteries are common and popular BESS, as these provide advantages of being small, lightweight and have high capacity and energy density, requiring minimal maintenance and a long lifespan.

Although safety incidents for BESS are rare, a common concern about BESS is the potential fire risk of Lithium-ion batteries. These can catch fire because of a process called "thermal runaway", which is a chemical reaction inside the batteries that can occur if part of a battery is damaged, or under stress due to external factors (such as an external fire generating excessive heat), or where the battery is not used in accordance with manufacturer's instructions. This reaction is hard to stop, the internal components of the battery decompose and produce heat and without external cooling this cycle results in fire.

The fire is hard to extinguish as batteries contain a lot of fuel to sustain the fire and continue until the chemicals involved have been depleted and the stored energy discharged.

Fires involving Lithium-ion batteries, can pose significant risks. A large volume of vapour and heat is produced, the vapour is toxic and flammable and possibly explosive. It is hard to fully extinguish fires involving Lithium-ion batteries and requires copious amounts of water and any water runoff used to tackle the fire emergency, will pose a risk to the environment.

BESS sites can be difficult to identify, they can be located anywhere, in rural and urban locations. They may look like general shipping container storage sites or be within existing premises.

The construction and structure housing BESS is an important factor, as building regulations for new permanent or new temporary structures apply fire safety requirements (this includes to limit the spread of fire and have systems that give an early warning). It is a building regulations requirement, and not a requirement for BESS, so that can result in BESS housed in other structures where there are building regulations exemptions.

Detached buildings are exempt from Building Regulations 2010, if people do not normally enter them or enter intermittently to inspect or maintain plants or machinery, and exemptions apply for any other kind of structure or erection.

In England, decisions on BESS's (regardless of their capacity) are made by local planning authorities. The Government through its planning practice guidance, encourages developers and local authorities to consult their local fire and rescue service on planning applications for BESS. However, the fire and rescue service are not statutory consultees, so local planning authorities are not required to consult them. It is an optional consultation.

We will strongly recommend that all Local Authorities consult with HIWFRS on a voluntary basis as detailed within HIWFRA's Position Statement for Building Regulations, Planning and Legislation.

We will advocate for the Fire and Rescue Service to be a statutory consultee at the planning stage as detailed within HIWFRA's Position Statement for Building Regulations, Planning and Legislation.

BESS is a new and fast-moving industry, standards and guidance may change as the industry and technology develops. When planning consultation requests are received, HIWFRS Fire Engineering Consultancy Team (FECT) will provide advice based on industry guidance at the time of consultation.

We will monitor any changes in legislation and professional guidance that affect BESS and engage with local authorities and others providing advice as appropriate.

Where BESS sites are identified whether through planning consultation or identified by other means such as within existing sites, it is important that risk information is collected, making operations more efficient and effective. This early intervention improves public and firefighter safety, minimise environmental impact and the economic cost of fire.