

141-PSS-OP-Kirkby Emergency Response Plan Kirkby BESS Revision 2

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Emergency Response Plan

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Abbreviations & Definitions

ADB	Approved document B (fire regulations)
AESC	Advanced Energy Storage Cells
AI IoT	Artificial Intelligence, Intelligence of things
BAU	Battery Array Management
BCU	Battery Cluster Management Unit
BESS	Battery Energy Storage System
BMS	Battery Management System
BMU	Battery Management Unit
ERP	Emergency Response Plan
ESMS	Energy Management Storage System
FPS	Fire Protection System
FRS	Fire & Rescue Service
ICS	Incident & Command System
LFP	Lithium Iron Phosphate (battery)
LiFePO ₄	Lithium Iron Phosphate
NFCC	National Fire Chief's Council
NFPA	National Fire Protection Association
PCS	Power Conversion System
TMS	Thermal Management System
UL	Underwriters Laboratory
UPS	Uninterrupted Power Supply

1.0 INTRODUCTION

Pelagic Energy operate a 57MWh Battery Energy Storage System (BESS) to the East of Coopers Lane, Kirkby, Merseyside L33 7TT.

The development is capable of storing electricity from the grid at times of excess supply and exporting it back to the grid at times of high demand/reduced energy capacity. The site is approximately 0.49ha in size.

The site connects to the National Grid for up to 114MWh of Battery Storage to the National transmission system.

- The wider site accommodates 36 battery containers, arranged largely in twin blocks. Each container measures 9.33m in length, by 1.78m width and has a maximum height of 3m.
- There are **nine PCS MV stations** measuring 6m length by 2.43m width and having a maximum height of 3.3m.
- The site is surrounded by a 2.4m weldmesh fence
- Within the Auxiliary transformer compound there is a Control room measuring 6m in length by 3m depth and a height of 3.43m
- Switch gear container measuring 9.73m in length by 4.5m width and having a maximum height of 4.33m
- There are x5 no. lighting and CCTV columns reaching a maximum height of 6m

This Emergency Response Plan (ERP) documents the procedures in place to prepare for and respond to an emergency at the site.

The Plan outlines emergency response responsibilities of personnel and outlines guidance for off-site responders. It also identifies training provided to site personnel in responding to emergencies and identifies drill procedures and incident investigation procedures.

1.1 Review of the ERP

This ERP is reviewed annually or as soon as practicable after:

- Any relevant regulations are revised
- The ERP fails in an emergency
- Circumstances arise that may increase the potential for emergencies, such as changes in Project design, construction, operation or maintenance practices
- Emergency response procedures change
- The list of emergency contacts or coordinators change
- The list of emergency equipment changes, or
- A significant change occurs in the operation of the Project

Regular engagement with local Fire and Rescue Service is part of the ERP plan to ensure they remain aware of current hazards at the site.

2.0 ACCESS, EGRESS & SITE INFORMATION

2.1 Site Address

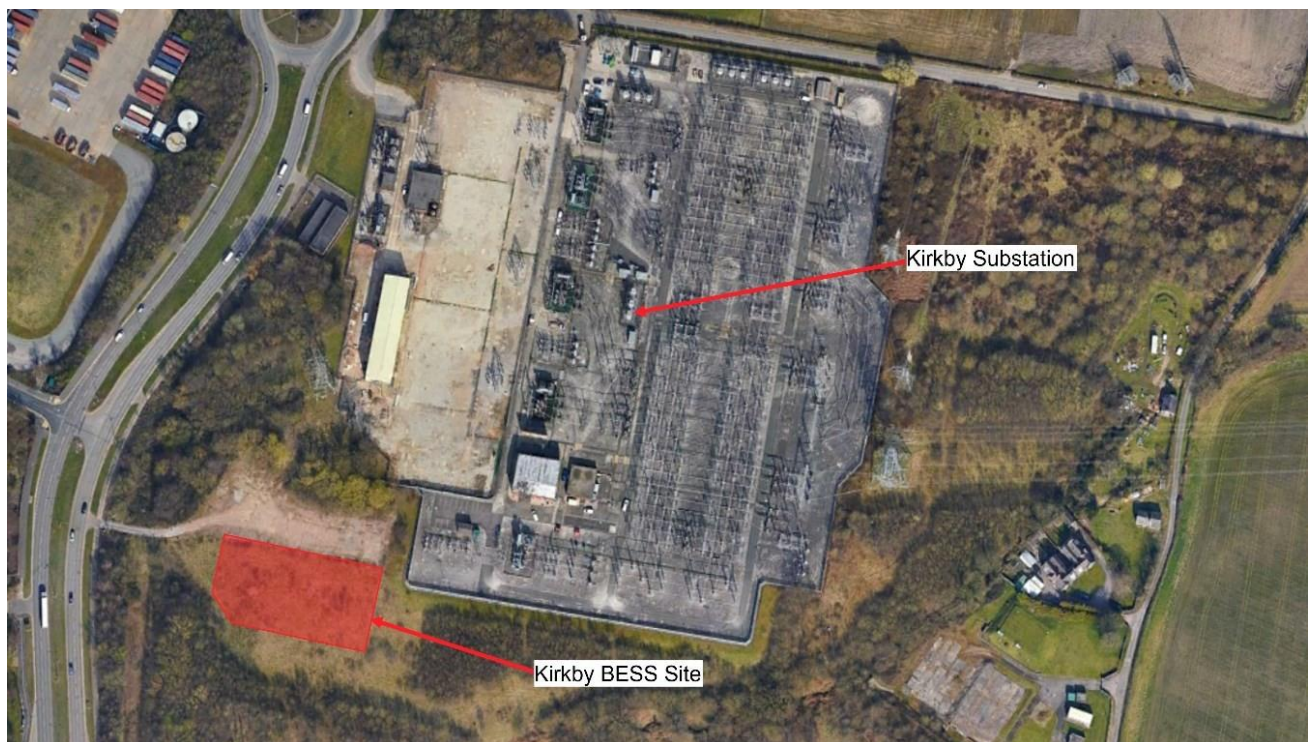
Access to the site is via the B6097 Elsecar Road.

Full Site name: Kirkby Battery Energy Storage System

Full Site address: Coopers Lane, Kirkby, Merseyside L33 7TT.

WTW: extensive.fetches.motel

2.2 Site Map



2.3 Staffing and contact details

The Project is unstaffed except for periods of routine maintenance. Off-site personnel are available remotely via mobile phone to support an initial emergency response. The site also has a designated contact person assigned to the system.

Contact name/role	Company	Email	Phone
Site Project Manager	Davin Farren	davidfarren@advancegrid.co.uk	TBC
Deputy Project Manager	N/A	N/A	N/A
CCTV Office	Site Eye	TBC	TBC
CCTV Manager			
Nearest hospital: Aintree University Hospital, Longmoor Lane, Liverpool L9 7AL. 0151 525 5980			

The system is continuously monitored remotely, and staff personnel and emergency response are automatically contacted during an emergency response event as outline herein.

There can be multiple external contractors that may visit the site. This number increases during routinely scheduled outages when the site is shut down for maintenance activities.

2.4 Emergency Response Roles

In the case of an emergency the Site Project Manager will assume the role of the Emergency Coordinator.

If the need arises, additional project personnel will support the Emergency Coordinator with technical, operational or site-specific data. The Emergency Coordinator is considered the “person in charge” of the project and the operations during an emergency until such time that emergency response agencies (i.e., fire brigade) arrive on-scene.

The **Emergency Coordinator** is responsible for multiple functions during an emergency, including:

- Ensuring the facility is effectively closed down
- Ensuring the site is evacuated, or specialist contractors are sent to deal with an emergency
- Assessing the situation and determining the level of response required
- Ensuring sufficient and suitable resources are available for the emergency services to assist them in their duties
- Acting as the liaison between the site and the emergency services
- Recording and reporting the incident as appropriate - and to the relevant bodies
- Leading the incident investigation following the emergency

The Remote System Operator is responsible for ensuring the Emergency Coordinator and Emergency Services are informed. It may also be the case, using the CCTV system they can monitor and advise the emergency services during an emergency.

The Remote System Operator will also assist the Emergency Coordinator as needed and will assist with the incident investigation process following the emergency.

All **employees, contractors and visitors** are responsible for reporting the discovery of an emergency to the Emergency Coordinator. These people are not required to perform emergency response activities except to call 999 as required.

2.5 CCTV/ Security Contact

Remote system operators monitor the Project 24 hours per day 7 days a week.

Before accessing the site, staff, contractors and visitors must inform the CCTV surveillance company by contacting their control centre via telephone. Once the camera alarms have been deactivated, access shall be granted. (see the table in section 2.3 above for contact details).

The site is secured by a weld-mesh fence and access provided via locked gate. The gate is closed and always locked when no-one is on site. Contractors are advised to leave the gate open whilst they are on site to allow free access to any emergency services, if required. Access is limited to those persons requiring entrance to maintain the safe operation of the equipment. Visitors and contractors are required to sign into a log-in system maintained by the site host.

Remote system operators have access to project operating data via the Supervisory Control and Data Acquisition (SCADA) control system which collects data from the BESS Energy Management System which monitors all operating data and controls system operation. Additional safety and security measures include communications with site host representatives, audible and visible fire alarms, and mobile phone communication between the remote system operators and contractors

3.0 HAZARDS & RISKS ASSOCIATED WITH BATTERY STORAGE

There are multiple, well-documented hazards associated with Battery Energy Storage Systems. The table below outlines the principal dangers on the site below and are expanded upon in their specific sections.

Table: BESS principal hazards

Category	Hazard	Outline	Risk
Electrical	DC Voltage	Primary voltage of storage system	Electrocution
	AC Voltage	Primary voltage of aux power system	Electrocution
Chemical	Ethylene Glycol	Coolant used in battery liquid coolant system	See Safety Data Sheet
	R454B Refrigerant * See below	Refrigerant used in HVAC system	See Safety Data Sheet
	Li-iron Phosphate Electrolyte	Battery electrolyte used in LFP battery cells	Toxic fumes and/or chemical burns
Fire & Explosion	Electrical Fire	Fire caused by cable fault or component failure	Fire
	Thermal Runaway	Thermal runaway from battery fault or heat	Fire, off-gassing
	Battery off-gassing	Off-gassing from thermal runaway	Explosion

- Only utilised in some systems

3.1 Electrical hazards

Containerised DC system (principally DC Voltage)

Envision's 5 MWh containerised system consists of key components including battery cell, pack, DC and AC (see below) systems. The DC Container is powered by AESC's 315 Ah LFP (Lithium-Iron Phosphate) prismatic cells. The battery voltage range is 1165-1500V in a six-pack configuration within the container.

The main components are:

- **Battery Rack:** A battery assembly composed of battery packs connected in series and congregated at the Battery Junction Box
- **Battery Pack:** A battery assembly composed of battery cells connected in series or parallel with BMU monitoring and protection circuits
- **Battery Junction Box:** A rack-level monitoring and control unit composed of BCU electrical control and protection components
- **Liquid Cooling System:** A cooling system composed of pack-level cooling plates, piping, and a chiller unit. A mixed water and glycol solution is adopted as the coolant
- **Fire Protection System:** A fire detection and suppression system composed of alarming systems, heat sensors, smoke sensors, flammable gases sensors, aerosols, and optional water sprinkler system
- **DC Combiner Panel:** A DC combiner panel brings the congregated DC cables from battery racks to a common DC bus.

AC Voltage: Exposure to 33kV.

The system requires AC power to supply its auxiliary requirements such as: control systems, HVAC system and supporting equipment. It therefore provides an electrocution hazard unless handled safely.

The main components are:

- **AC / DC Power Distribution Panel:** The AC / DC power distribution panel houses the auxiliary components and its distribution to critical components including thermal management system (TMS), UPS, FPS, battery management system (BMS), and local controller.
- **Local EMS** The local controller aggregates system-level operational data and harmonises with PCS and site-level EMS.

Electrical Fire can result from a short circuit, failed OCPD (over-current protection device), or other electrical component failure, electrical fires are possible. The unit therefore includes heat and smoke detectors to alarm to the fire panel and EMS in such conditions.

Arc Flash

Battery systems present a potential source of arc flash energy. The electrical characteristics of batteries is such that their energy is readily discharged. When coupled to suitable high voltage and capacity levels they can supply high magnitude and high rate of change of fault current. This rapidly developing fault current can quickly contribute energy to a fault, risking an arc flash event. Whilst the arc flash risk is relatively well understood for AC systems, DC arc flash assessment is less standardised. Effective electrical protection is key to mitigating arc flash risk as well as appropriate PPE for operators and emergency services.

Other than isolating the power supply, completely eliminating the arc flash hazard is very difficult, but there are measures you can take to reduce the possibility and severity of hazards.

Control measures can be adopted to reduce both the hazard and likelihood of taking place, therefore reducing the risk, such as:

- De-energising electrical equipment
- Wearing suitable Personal Protective Equipment (PPE)
- Keeping at a safe distance
- Reducing the energy output from an incident
- Train on-site workers to control risks and interrupt faults

3.2 Chemical hazards

Lithium-Iron Phosphate batteries are not dangerous under normal usage conditions. However, if a LiFePO_4 battery does ignite, it *can* release toxic fumes, potentially causing respiratory and other problems such as risk to chemical burns, particularly dangerous if the chemical comes into contact with the eyes or mouth.

A 50% Glycol and 50% water solution is utilised in the liquid cooled thermal management system. Glycol is known with having the potential to harm the eyes, skin, kidneys, and respiratory system. Ethylene glycol can cause death if swallowed. Workers may be harmed from exposure to glycol. The level of exposure depends upon the dose, duration, and work being done.

3.3 Fire and Explosion

The Dangerous Substances and Explosive Atmospheres Regulations 2002 require employers to carry out risk assessments. This could potentially lead to ATEX (*Atmospheres Explosive*) zones being designated on site.

The primary DSEAR hazard onsite are Lithium-Iron Phosphate batteries which although inherently safer than the historic 'standard' L-ion batteries used in older storage facilities, still can, under certain circumstances catch fire and explode.

Whilst this new generation of battery is unlikely to propagate incipient 'fire' in neighbouring cells. (battery 'fires' are not true fires as they don't require Oxygen to propagate them) or produce gases including Hydrogen & Methane (amongst others) - a significant danger of the old cells. It is important to note which areas are classed as hazardous zones and any requirements therein such as the use of intrinsically safe tools and safe systems of work. Thermal Runaway still remains a possibility but by using LiFePO_4 batteries this is significantly reduced.

It is also important to consider how risks can be brought on to the site. The obvious 'culprits' here would be explosive gases such as acetylene or propane, even non-flammable gases such as Oxygen or Argon stored in cylinders under pressure in certain circumstances can explode. Control over these substances is rigorously managed via the use of RAMS, induction and Permit to Work systems.

3.4 Environmental hazards

Prevention of liquids entering local water systems

Attenuation tanks are located on the site to deal with excess rain water and/or surface water to reduce the risk of localised flooding. This system will store water temporarily and release it into a watercourse or sewer at a controlled rate.

Preventing contaminated fire water run-off from entering the watercourse under legislation such as Environmental Damage (Prevention and Remediation) Regulations 2009 is a primary site focus.

Any fire water runoff will be collected from BESS units, transformer skids and ancillary equipment fitted with sump collection as well as the site providing permeable paving and perforated drainage pipes taking any water collected on site to the attenuation tank for further separation and discharge under local authority water discharge consent.

Ground contamination

It is not envisaged that any chemicals/petrochemicals will be spilled in any sufficient quantity. Transformers have sumps, and there is a rigid spills procedure in place on site. IF, spills do occur, the Site Project Manager must be informed and the incident control procedure outlined in this document be followed.

Release of toxic gases.

If toxic gases escape beyond the site boundary, or there are cross winds that affect any fumes/smoke, the Project Site Manager will liaise with the emergency services to ensure any site neighbours are informed and building windows closed or evacuation procedures are put in place.

Localised weather events

In the case of extreme inclement weather such storms, heavy rainfall, high winds, snow, etc. the site will monitor its activities as per normal with liaison between the Site Project Manager and the remote system operators to ensure the system can/is closed down commensurate to the current conditions. This is particularly relevant in the case of lightning occurrences.

The site is not in an area susceptible to flooding.

4.0 SAFETY SYSTEMS, ALARMS & PROTECTION

The FPS detects, alarms, and suppresses thermal runaway events at early stage. The battery container is equipped with smoke detectors, heat detectors, and CO and H₂ combustible gas detectors to swiftly identify potential risks of battery or electrical fires. The active exhaust ventilation and deflagration venting system are designed to NFPA 69 and 68.

The control and safety systems (control architecture) have a Battery Management System (BMS) with built-in fail-safe automated algorithms.

The control and safety system will provide an effective and appropriate method of early detection of a fault of the batteries and consequent disconnection shall be provided when normal voltage or temperature limits are exceeded. Such limitation or disconnect would be alerted to the control room.

The BMS has a three-layer control topology, actively monitors and regulates cell parameters to prevent failures and maintain performance. The adoption of AI IoT fault detection systems for early detection of thermal runaway events, enables proactive intervention before hazards escalate.

The deployment of gas detection systems, including Hydrogen and Carbon Monoxide sensors, identify off-gassing concentrations and facilitate rapid response and early risk mitigation.

The BMS three-layer architecture outlined above consists of:

- The system level Battery Array Management unit (BAU)
- Rack level Battery Cluster Unit (BCU) and
- Pack level Battery Management Unit (BMU)

Each unit has FPS equipment including:

- Smoke Sensors (x4)
- Heat sensors (x1)

- Carbon Monoxide detectors (x1)
- Hydrogen detectors (x1)
- Deflafration Panels (x6)
- Aerosol units (x5)

5.0 RESPONDING TO AN EMERGENCY

5.1 Emergency Classification

The response system is simple in that any employees or contractors on site only act defensively in the event of an emergency.

All offensive response actions are handled by trained external responders. As a result, emergencies at the site are classified as either “controllable” or “uncontrollable,” based on the site’s ability to manage the situation without outside assistance.

5.1.1 Controllable Emergency: A “Controllable Emergency” meets all of the following definitions:

- Minor in nature, meaning
 - No one has or is likely to become injured or
 - If injuries have occurred, they are first aid only and
 - Onsite personnel have the training and equipment needed to contain or stop a release of a hazardous material (liquid, solid, gas, including smoke) without the assistance of off-site responders
 - Confined to the site and falls within the training of site personnel
 - Can be handled without the assistance of off-site emergency responders.

Examples of Controllable Emergencies that may occur include the following:

- An injury to a site contractor that requires basic first aid for treatment or
- A small leak of an oil, which can be absorbed, neutralized or otherwise controlled at the time of release

5.1.2 Uncontrollable Emergency: An “Uncontrollable Emergency” meets any of the following definitions:

- An event that has or could potentially go beyond the defensive capabilities of site personnel
- Involves injuries that require treatment beyond first aid or
- Requires off-site emergency response resources because the expertise or equipment required to respond is not available or because the emergency could impact off-site receptors.

Examples of Uncontrollable Emergencies that may occur include the following:

- An injury which requires advanced medical treatment (bracing, splinting, stitches)
- Any fire within the equipment which has the potential to become bigger, or
- A significant gas leak during a fire.

5.2 Phases of Response

5.2.1 Discovery

This phase encompasses discovery of the incident through to mobilisation of the response system.

Anyone may be involved in this phase. Discovery of the incident is immediately reported to the Site Project Manager, who assumes the role of Emergency Coordinator.

5.2.2 Initial Response

This phase begins when the Emergency Coordinator assumes control.

A concise assessment shall be conveyed to incoming responders that includes a scene assessment including the following in plain language:

- Where the incident is located
- What has happened
- What is occurring
- Any injuries or unaccounted for individuals
- What the needs/resources are

Additional considerations should include:

- Hazards and facility safety concerns such as high voltage areas or other electrical concerns
- Fire and explosion risks
- Chemical release/toxic fumes
- Any other dangers highlighted by the initial call to the Emergency Coordinator

An Incident Command System (ICS) shall be established immediately and shall include designation of roles for on and off-site. **Names of specific people and roles are highlighted section 2.3.**

Once the fire brigade arrives on site, the senior officer will take on the role of Incident Commander from the Site Emergency Coordinator. At the same time as these activities are occurring the Emergency Coordinator shall immediately coordinate with the Remote System Operator to establish available data from the Battery Management System (BMS) and communicate this to the appropriate Incident Command individual.

This phase is complete when there is no longer imminent danger to human health, the environment or project equipment.

The Site Emergency Coordinator will have the responsibility of Project communications throughout the incident and acting as liaison between the response agencies and the Project.

5.2.3 Demobilisation/Termination

This phase begins when off-site responders demobilise and depart. The Site Project Manager regains overall control and responsibility.

It encompasses decontaminating equipment, disposing of and proper documentation of wastes, removing damaged equipment from the site, maintaining site safety and security, and returning response equipment to its useable condition and readily available location.

Follow-up: This is the administrative conclusion to the incident, which includes preparation of reports, investigations, critiques, and follow-up to recommendations.

6.0 EMERGENCY ARRANGEMENTS

As the BESS is remotely monitored, an Information Box (IB) has been fixed at the FRS access point. The purpose of the IB is to provide information for first responders e.g., Emergency Response Plan, to include water supplies for firefighting, drainage plans highlighting any Pollution Control Devices (PCDs) etc for the FRS.

The main access road to and from the site is designed in accordance with guidance of Approved Document B (ADB). Although ADB is not applicable as this site is exempt under the Building Regulations as it is classified as a building with infrequent occupants, ADB therefore provides useful access road specifications which are outlined in the table below. It should be noted that we are aware fire vehicles differ across the UK for different fire and rescue services and require different access route specifications, however, the table below has been used as a guide to produce the site design and this document.

Appliance type	Minimum width of road between kerbs (m)	Minimum width of gateways (m)	Minimum turning circle between kerbs (m)	Minimum turning circle between walls (m)	Minimum clearance height (m)	Minimum carrying capacity (tonnes)
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High reach	3.7	3.1	26.0	29.0	4.0	17.0
Typical Fire and Rescue Service vehicle access route specification						

Source: ADB, Volume 2 Buildings other than Dwellings; 2019 edition incorporating 2020 and 2022 amendment

With the site being land locked by adjoining National Grid land, a second access route is not possible, all access routes are via the Coopers Lane entrance. The site has a very small area of 4,451m², the provision of two entrances is not considered necessary to allow effective firefighting operations.

The roads on site are hard-wearing surfaces that are capable of accommodating vehicles, including fire and rescue service vehicles, in all weather conditions. The internal roadway will include the provision of a hammerhead meeting the guidance given in BS 9999 for the use of fire and rescue vehicles.

6.1 Fire Hydrant and Water Supplies

At the time of writing the site is not connected. Once the design of the internal pipes has been completed, application will be made to the local water company for a connection. The nearest hydrant connection is the statutory hydrant located on Coopers Lane, via a spur (see below). The existing flow rates are to be confirmed, as part of the Water Authority application process, but as the existing hydrant system also serves the adjoining Knowsley Industrial Park, it should be sufficient in flow rate and pressure for the BESS site and fall in line with the NFCC guidance on Grid-Scale Battery Energy Storage System Planning (2023)

NFPA 855 recommends at least 3metres between the BESS enclosure and vegetation and other combustible growth. Internally this is satisfied at Kirkby as the ground on site is predominantly gravel and no vegetation is proposed. The landscaping on the site will be managed and maintained on a regular basis to prevent the possibility of any wildfire occurring. External to the site, the perimeter fence is surrounded on three sides by scrubland, again the vegetation will be managed to ensure the risk of wildfire is reduced to as low as reasonably practicable.

6.3 Switchgear & Control Room

The distance between BESS and the Switchgear Building and the Control Room is a minimum of 3 metres.

The BESS will be monitored by the on-site control systems (SCADA) as well as being monitored 24/7 by a remote offsite control room. The offsite control room will have the ability and authority to immediately shut BESS down should the need to do so arise. Upon detection of an overtemperature or fire incident, the alarm condition will be transmitted to a control room and an offsite control centre that will in turn send an alarm to the local fire and rescue service.

7.0 FIRE FIGHTING

7.1 General:

Although the ultimate decision of how the fire shall be fought and extinguished by the Fire Brigade Incident Commander, the following general guidance is provided:

Attempt to extinguish the fire only if NO imminent threat to life safety exists.

If there is immediate threat to life safety, allow the BESS to burn in a controlled fashion until all fuel sources inside are depleted. A defensive approach should be considered utilising water to cool and protect adjacent exposures and mitigate the spread of fire.

Remove or protect adjacent vegetation to avoid providing an additional fuel source which may aid the spread of fire. The Site Emergency Coordinator shall provide guidance on conditions inside the adjacent battery containers and whether defensive cooling is needed

Full firefighting protective gear shall be worn in any response to a fire and/or explosion event or any indication a fire may be present. This shall include proper use of Self-Contained Breathing Apparatus (SCBA).

If no fire or explosion risk is present, Arc Rated protective clothing to protect against arc flash and shock shall be worn. Jewellery such as necklaces must be removed to avoid contact with any electrical hazard.

7.2 Re-ignition:

The risk of battery re-ignition remains present for hours or even days after the smoke/flame is initially detected. Even if a lithium-ion battery fire has been extinguished there is still a risk of re-ignition. Chemicals released during a fire or explosion will be in a gaseous form and primarily pose an inhalation hazard but should rise and disperse.

A fog pattern from a handline or monitor nozzle may be an effective way to control the off-gassing event on the exterior of the battery container from migrating to unwanted areas.

If any indicators are present of damage or heat to an adjacent system, the BMS data shall be closely monitored for the adjacent system and relayed to the appropriate individual within the Incident Command System. Following partial or complete consumption of the system by fire, batteries may continue to emit low levels of flammable gases and dangerous levels of toxic gases for an extended period of time. Continuous monitoring of gas levels in and around the incident location shall be conducted and use of mechanical ventilation may be utilized to manage gas levels. Full firefighter PPE and SCBA shall be utilized until gas levels are confirmed to be at a safe level. A fire watch shall be performed for a minimum of 24 hours after any fire incident.

8.0 SITE OPERATIONAL PROCEDURES

The following guidance is part of the Fire Risk Assessment for operations when an emergency/fire breaks out at site level for operatives to follow:

Emergency Evacuation Plan

When sensors within the BESS enclosures detect conditions that indicate a fire, an audible alarm will sound, and a visual strobe will flash on the enclosure exterior.

Smoke and/or flame may or may not be visible from the outside of the BESS enclosure. Fire growth can be slow, fast, or explosive in nature.

Emergency Action Notice

When contacting the emergency services, please follow the below steps:

1. Dial 999
2. Request "AMBULANCE" "FIRE SERVICE" OR "POLICE"
3. State your name and give the plant's address
4. Describe the incident, or if applicable, the condition of the injured worker:
5. Is the worker conscious?
6. If not, is the worker breathing?
7. Is there severe bleeding? Where is the bleeding?
8. Injury type; crush, fracture, broken bones, seizure, vomiting, serious burns etc.

Discovering a Fire

1. Raise an alarm - Shout "FIRE" "FIRE".
2. Only utilise fire-fighting equipment in the event of aiding access or egress from the immediate area.
3. If fire control fails; evacuate the building/ site.
 - Walk, do not run.
 - Do not carry belongings/ equipment/ company assets.
4. Proceed to the nearest Emergency Assembly Points – Any of the access gates.
5. Contact the site operatives. If lone working, raise your panic alarm.
6. Telephone 999 and ask for the fire brigade. Give site address details.
7. Site supervisor to perform a head count.
8. Only re-enter site once the Emergency services have controlled the fire and confirmed it is safe to do so.

Hearing the Alarm

1. Stop all maintenance activities and switch off any plant engines.
2. Leave the building / site.
 - Walk, do not run.
 - Do not carry belongings/ equipment/ company assets.
3. Proceed to the Emergency Assembly Points – Any of the access gates.
4. Co-operate with the head count.
5. Only re-enter site once the Emergency services have controlled the fire and confirmed it is safe to do so

9.0 SABOTAGE & TERRORIST THREAT

There is always a possibility of deliberate action aimed at the site through subversion, obstruction, disruption, and/or destruction by individuals or groups. It is therefore vital that any disturbance or unusual occurrence, suspected or determined to be caused by sabotage, are reported to the appropriate systems, and escalated where necessary to government or regulatory agencies.

Sabotage events can be classified into two general categories: Physical and Cyber.

Within these two categories, attacks can be characterized by one or more of the following traits: External or Internal, and Primitive or Sophisticated.

Whilst every potential avenue cannot be catered for in this report, the following section provides general guidance to assess and identify attempted sabotage.

Sabotage Indications:

9.1 Cyber

The following criteria may be used as a guideline for classifying an act of cyber sabotage.

- Repeated attacks from the same range of Internet protocol (IP) addresses or a sustained spike in attack activity during a period can be an indication of cyber sabotage
- A spike in internal bandwidth usage may indicate that systems have been penetrated
- Server and firewall logs should be monitored for suspicious activity.
- Security plan reviews which monitor any out-bound Internet activity can aid in sabotage detection
- Recognise that some internet attacks involve the penetration of computers for the sole purpose of utilising those computers in a coordinated attack on a third party. Personnel should also be aware that not all cyber incidents are purely electronic in nature.
- Phone calls, letters, or requests from unrecognised individuals for passwords and network information are potential incidents as well.

9.2 Physical

This form can be any act that affects personnel, property, facilities, operating systems, and materials. While the results of physical sabotage may be easy to spot once an attack has been launched, the planning and preparation for a coordinated physical attack can easily be masked.

Physical sabotage can originate through unauthorised entry, or by staff members or contractors who are authorised to be on site. They can be well-planned, coordinated efforts involving multiple people, or they

can occur without any pre-planning, from people intent on causing harm to a Project.

There are many forms of sabotage that need vigilance to prevent or diligence in reporting. This include but are not limited to: bomb threats, damage to equipment, release or spill of chemical or petroleum products, fire/explosion, loss of generation/load, theft of tools, parts or equipment required to support normal operations or damage or disabling of any Project systems.

Breach of the physical security perimeter and trespassing can and should also fall under this heading.

9.3 Sabotage Reporting and Notifications

Disturbances or unusual occurrences suspected or thought to be caused by sabotage, should be immediately reported to the Project Manager who will assess appropriate response to authorities.

10.0 EMERGENCY TRAINING & DRILLS

Any new employee involved with the project shall be provided with training within the first 1 month of employment, covering the contents of this plan; identification of hazards on site; what to do in the event of an incident. All employees shall be provided with training as updates are included in this plan.

Drills may involve response agencies, including the local Fire Department. The drills vary in nature and include specific emergency response activities such as spill response or fire. All drills are documented and reviewed to provide areas for improvement

Drills should include, as a minimum

- the hazards associated with lithium-ion batteries
- isolation of electrical sources to enable fire-fighting activities
- measures to extinguish or cool batteries involved in fire
- management of toxic or flammable gases, minimise the environmental impact of an incident
- containment of fire water run-off
- handling and responsibility for disposal of damaged batteries

11.0 DECOMMISSIONING & DISPOSAL

The decommissioning of a BESS site presents similar health and safety risks to its commissioning, due to changes in the site's operation and potential removal of safeguards. Considerations should include:

- disconnection from grid – the relevant TO/DNO should be consulted where work to remove grid connection equipment is planned, to avoid disruption to the wider network.
- life extension/ repowering – it may be desirable to extend the working life of the site through refurbishment or replacement of some equipment, such as degraded battery cells.
- New risks may also be introduced where storage equipment is repurposed, relocated or used in second life applications. Many of the principles described in earlier sections would apply for risk assessing these applications.

The Waste Batteries and Accumulators Regulations 2009 require that “industrial batteries” – a definition that applies to BESS li-ion cells – must be sent for recycling by an approved operator. Distributors of industrial batteries are also obliged to take back waste cells free of charge when requested by the end user. BESS developers should consult with proposed battery suppliers at an early stage to establish their processes for take-back and recycling, and to ensure as far as possible that these schemes (or equivalents) will be available at the predicted end of site life. Developers should also be aware of the Waste Electrical and Electronic Equipment Regulations 2013, which imposes broad obligations on recycling of electronic products. While the core equipment of a BESS site may not meet this definition, many items installed on site will – examples may include computers and display equipment, monitoring, control and communication instruments and lighting equipment.