Rosefield Solar Farm

Outline Battery Safety Management Plan (~~Clean~~Tracked)

EN010158/APP/7.9.~~3~~4
Revision ~~3~~4
Deadline ~~2~~3
~~April~~May 2026
Rosefield Energyfarm Limited

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

1. Executive Summary

1.1.1. The Outline Battery Safety Management Plan (oBSMP) for the Rosefield Solar Farm has been developed to ensure the safe construction, operation, and decommissioning of the Battery Energy Storage System (BESS). This document outlines key safety provisions in the event of a very rare thermal runaway emergency event, including fire risk reduction measures, fire protection systems, and emergency response planning. The oBSMP emphasizes adherence to industry best practices, legal requirements, and relevant guidance to mitigate risks to life, property, and the environment. The oBSMP identifies how the Applicant would use good industry practice to reduce risk to life, property, and the environment from the BESS.

1.1.2. Key components of the plan include consultation with stakeholders such as the Buckinghamshire and Milton Keynes Fire Authority and the UK Health Security Agency, as well as the integration of safety objectives like minimizing thermal runaway risks, ensuring safe evacuation, and enabling firefighter safety. The plan also addresses pre-construction requirements, operational safety systems, and safe decommissioning practices. By following this framework, the Applicant aims to demonstrate compliance with safety standards and ensure the BESS installation operates securely and responsibly.

Table of Contents

2. Introduction

2.1. Introduction

2.1.1. This document has been updated at Deadline 3~~2~~ in response to further engagement with the Environment Agency. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [EN010158/APP/1.2.~~7~~8]** for the list of current versions of documents.

2.1.2. This Outline Battery Safety Management Plan has been prepared on behalf of Rosefield Energyfarm Limited ('the Applicant') in relation to the Development Consent Order (DCO) application for the construction, operation (including maintenance), and decommissioning of Rosefield Solar Farm (hereafter referred to as the 'Proposed Development').

2.2. The Order Limits

2.2.1. The extent of the Order Limits are shown in **Location, Order Limits and Grid Coordinate Plans [EN010158/APP/2.1]** and the Proposed Development is described in full in **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]** and shown spatially on the **Works Plans [EN010158/APP/2.3].**

2.3. The Proposed Development

2.3.1. The Proposed Development comprises the construction, operation (including maintenance), and decommissioning of solar photovoltaic ('PV') development and energy storage, together with associated infrastructure and an underground cable connection to the National Grid East Claydon Substation.

2.3.2. The Proposed Development would include a generating station with a total exporting capacity exceeding 50 megawatts ('MW').

2.3.3. The location of the Proposed Development is shown on **ES Volume 3, Figure 1.1: Location Plan [EN010158/APP/6.3]**. The Proposed Development would be located within the Order Limits (the land shown on the **Works Plans [EN010158/APP/2.3]** within which the Proposed Development can be carried out). The Order Limits plan is provided as **ES Volume 3, Figure 1.2: Order Limits [EN010158/APP/6.3]**. Land within the Order Limits is known as the 'Site'.

2.4. Purpose of this document

2.4.1. This outline Battery Safety Management Plan sets out the key fire safety provisions for the Battery Energy Storage System (BESS) proposed to be installed at the Proposed Development including measures to reduce fire risk and fire protection measures.

2.4.2. This document provides a summary of the safety related information requirements which would be provided in advance of construction of the BESS. The purpose of this outline Battery Safety Management Plan is to identify how the Applicant would use good industry practice to reduce risk to life, property, and the environment from the BESS.

2.4.3. Prior to the commencement of construction of the BESS, the Applicant would be required to prepare a Battery Safety Management Plan (BSMP) which must be in substantial accordance with this outline Battery Safety Management Plan. As part of preparation of this BSMP, the Applicant would consider the latest industry good practices for battery fire detection and prevention, along with the emergency response plan, as guidance continues to develop in the UK and around the world. The Applicant will consult with relevant stakeholders including the UK Health Security Agency (UKHSA) and Buckinghamshire and Milton Keynes Fire Authority (BMKFA) when developing the BSMP.

2.4.4. Given that the timescale between the DCO Application and the operational phase of the Proposed Development, the approved BSMP may be updated prior to the Proposed Development's operational phase to ensure the most current guidance is incorporated and to demonstrate how the final design of the BESS would accord with guidance in place at the time.

2.4.5. For the purpose of this document, the following terms are defined as below:

- BESS Enclosure: The container that is storing the battery cells and racks/ modules.
- BESS Equipment: The equipment that makes up the BESS, including but not limited to the BESS enclosures, power conversion systems (PCS), transformers and switchgears.
- BESS Facility: The entire designated area allocated for the BESS including the associated infrastructure such as roads and buildings.

2.5. Structure of this Outline Battery Safety Management Plan (oBSMP)

2.5.1. This oBSMP is structured as follows:

- Section 1 – this Introduction;
- Section 2 – Safety Objectives and Guidance;
- Section 3 – Consultation;
- Section 4 – BESS Safety Commitments;

- Section 5 – Firefighting;
- Section 6 – Pre-Construction Information Requirements;
- Section 7 – Conclusions.

3. Safety Objectives and Guidance

3.1. Safety objectives

3.1.1. Safety objectives for the design of the BESS are:

- To minimise the likelihood of a thermal runaway event. This is the overriding priority.
- To minimise the consequences should a thermal runaway event occur.
- To restrict any thermal runaway event to the site and minimise any impact on the surrounding areas.
- To automatically detect and begin to control and mitigate a fire as soon as possible.
- To ensure any personnel on site are able to escape safely away from the site.
- To ensure that firefighters can operate in reasonable safety where necessary.
- To minimise the requirement for direct Buckinghamshire and Milton Keynes Fire Authority (BMKFA) intervention in a thermal runaway incident through BESS design and site layout.
- To demonstrate the system supports BMKFA strategies for tackling the event, for instance and if applicable at the time:
- Boundary cooling of adjacent BESS and equipment to prevent the fire from spreading.
- Allowing the BESS to burn out to remove the risk of stranded energy in the battery systems.
- To ensure that any firefighting water run-off can be safely contained and tested for pollutants before release, reuse or, if necessary, removed by tanker and treated offsite.
- To ensure that fire, smoke, and the spread of toxic gasses do not significantly affect occupants in surrounding buildings and areas, first respondents and the local community.
- The following sections set out the design responses incorporated into the Proposed Development in order to achieve these objectives.

3.2. Legal Requirements and Relevant Guidance

3.2.1. The Applicant is a joint venture between EDF Power Solutions UK and PS Renewables. EDF Power Solutions UK owns and operates 6no. lithium-ion BESS with an exemplary safety track record. Guidance documents and standards considered by the Applicant in the design and selection of these systems have been used to inform the design of the Proposed Development. There is currently limited UK specific guidance for BESS, however the Applicant operates globally and incorporates good practice from around the world.

3.2.2. The Applicant would develop the BESS in accordance with all relevant legislation and good practice in force at the time. The primary guidance to be used is the National Fire Chiefs Council (NFCC) guidance "NFCC Grid Scale Battery Energy Storage System planning – Guidance for FRS". Other guidance and good practice documentation would also be used where permissible under the NFCC guidance, including:

- National Fire Chiefs Council (NFCC) Grid-Scale Battery Energy Storage System planning – Guidance for FRS (2026)
- National Fire Protection Agency (NFPA) NFPA 855 (2026): Standard for the Installation of Stationary Energy Storage Systems
- NFPA 68 (2023): Standard on Explosion Protection by Deflagration Venting.
- BS EN 14797 (2006): Explosion venting devices.
- NFPA 69 (2024): Standard on Explosion Prevention Systems.
- NFPA 70 (2023): National Electrical Code (NEC).
- Underwriters Laboratories, UL 9540A Edition 6 (2026) Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems;
- UL 1642 (2020): Standards for Lithium Batteries.
- UL 1973 (2022): Batteries for Use in Stationary and Motive Auxiliary Power Applications.
- UL 9540 3rd Edition (2023): Standard for Energy Storage Systems and Equipment.
- UL 2941 (2023): Outline of Investigation for Cybersecurity of Distributed Energy and Inverter-Based Resources.
- Clean Energy Associates (2025): BESS Quality Risks. A summary of the most common Battery Energy Storage System manufacturing defects of 2024.
- European Association for Storage of Energy (2025): EASE Guidelines on Safety Best Practices for Battery Energy Storage Systems.

- Department for Energy Security and Net Zero (2024): Health and Safety Guidance for Grid Scale Electrical Energy Storage Systems.
- IEEE 2686 (2025) standard: Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications.
- FM DS 5-33 (2023) FM Global Datasheet. Lithium-Ion Battery Energy Storage Systems.
- UN 38.3: Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria – (Lithium Metal and Lithium-Ion Batteries).
- United Kingdom Power Networks (UKPN) Engineering Design Standard 07-0116: Fire Energy Storage Systems, 2016.
- DNV GL-Recommended Practice-0043: Safety, Operation and Performance of Grid-Connected Energy Storage Systems, 2017.
- Scottish and Southern Energy TG-PS-777: Limitation of Fire Risk in Substations, Technical Guide, 2019.
- BS 5839 Part 1 2017: Fire Detection and Fire Alarm Systems for Buildings.
- BS 9990: 2015: Non-automatic firefighting systems in buildings - Code of practice
- The Regulatory Reform (Fire Safety) Order (RRO) 2005.
- The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) Assessment.
- Fire Safety Journal (May 2025) Damilare Olugbemide/Noah Ryder: CFD analysis of performance-based explosion protection design for battery energy storage systems (BESS).
- BS EN IEC 61936, Power installations exceeding 1 kV AC and 1,5 kV DC – AC.
- BS EN IEC 62619 (2022): Secondary cells and batteries containing alkaline or other non-acid electrolytes. Safety requirements for secondary lithium cells and batteries, for use in industrial applications.
- BS EN IEC 62933-5-2 (2020): Electrical Energy Storage (EES) systems. Part 5-2: Safety requirements for grid integrated EES systems. Electrochemical-based systems.
- BS EN IEC 62281: 2019 + A2:2023: Safety of primary and secondary lithium cells and batteries during transport.

- BS EN IEC 62477-1 (2022): Safety requirements for power electronic converter systems and equipment. General.
- BS EN IEC 63056 (2020): Safety standard for lithium-ion battery systems.
- BS EN 16009 (2011): Flameless Explosion Venting Devices.
- BS EN 14373 (2021): Explosion Suppression Systems.
- BS EN IEC 61000-6-2 (2016): Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments.
- BS EN IEC 61000-6-4 (2018): Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments.
- CIRIA C736 (2014): Containment systems for the prevention of pollution.

-
- NFPA 2010 – Standard for Fixed Aerosol Fire-Extinguishing Systems
- .
- The Buildings Regulations 2010, Approved Document B (Fire Safety) – Volume 2. Adopted provisions can be found within section 2.4.
- Appropriate air quality guidelines and standards e.g. AEGLs (Acute Exposure Guideline Levels) and AQGs (Air Quality Guidelines)

3.3. Potential BESS Failure

3.3.1. Failure modes for BESS developments can be generally split into electrical, mechanical, chemical or thermal. The causes for failure could include issues such as: manufacturing defects, overcharging, over dis-charging, mechanical damage, overheating or abuse and short circuits; whether internal or external. If not identified and resolved, the main potential hazard is thermal runaway and ultimately, if not controlled, a fire. This management plan focusses on reducing fire risks associated with the BESS and managing the hazard in the unlikely event that it occurs.

3.3.2. Potential failures associated with the BESS would be assessed through a Failure Modes and Effects Analysis (FMEA) process and mitigations established through the Hazard Mitigation Analysis (HMA) process. As per HSE's hierarchy of controls, where possible, all failure modes and hazards would be eliminated or substituted. Due to the nature of lithium-ion BESS equipment, methods of elimination and substitution may not be possible and instead, engineering controls would be required.

3.3.3. Other electrical systems than the batteries which form part of the BESS can carry fire risks, however due to the extensive historic long-term deployment of other technology such as transformers, inverters and switchgears, these risks are better understood and regulated, through longstanding industry guidance and codes. Therefore, only the battery component of the BESS is addressed in this oBSMP.

4. Consultation

4.1. Buckinghamshire and Milton Keynes Fire Authority

4.1.1. The Applicant has consulted the local fire and rescue service, BMKFA, as part of developing the BESS element of the Proposed Development. An introductory meeting was held with BFA on 4th November 2024 to provide initial information about the Proposed Development and to seek early feedback. Further meetings have since taken place and a draft of the Plume Assessment for the Proposed Development and this Outline Battery Safety management plan has also been shared with BMKFA for their consideration and comment.

4.1.2. The outcomes of the discussion between the Applicant and Buckinghamshire Fire Authority are detailed in **Statement of Common Ground - Buckinghamshire and Milton Keynes Fire Authority [EN010158/APP/5.17].**

4.2. UK Health Security Agency

4.2.1. The Applicant has consulted the UK Health Security Agency (UKHSA) as part of the DCO process. An introductory meeting was held with the UKHSA 01 May 2025 to discuss the Proposed Development and the approach to the BESS plume assessment. A **Statement of Common Ground – UK Health Security Agency [EN010149/APP/5.12]** was produced and shared following the meeting.

4.3. Other Consultees

4.3.1. As set out in the **Consultation Report [EN010158/APP/5.1]** submitted with the DCO Application, the following statutory consultees made substantive comments on the BESS:

- Buckinghamshire Fire and Rescue Services
- East Claydon Parish Council
- Environment Agency
- Edgcott Parish Council
- Granborough Parish Council
- Steeple Claydon Parish Council
- Preston Bissett Parish Council
- Buckinghamshire Council
- Quainton Parish Council

4.3.2. The matters raised by the above consultees included the below, which are addressed in this oBSMP:

- Location of the BESS;
- Request for more information about how fire risk would be managed and monitored;
- Request for continued engagement with Buckinghamshire Fire Authority;
- Suggestions for fire safety measures that could be implemented within the BESS;
- Request for confirmation that the Proposed Development would not impact on human health.

5. BESS Safety Commitments

5.1. Overview

5.1.1. This section identifies the BESS lifecycle stages and outlines the requirements for control and safety during:

- Procurement and testing;
- Safe BESS design;
- Safe BESS construction;
- Safe BESS operation;
- End of life/BESS disposal.

5.2. Procurement and Testing

Procurement

5.2.1. The Applicant is a joint venture between EDF Power Solutions UK and PS Renewables. EDF Power Solutions UK has operated different battery technologies across a number of fields, including nuclear power. It operates with a stringent three stage prequalification process that leverages the global technological capabilities of EDF Power Solutions UK in the selection of all components, with particular focus on the battery technology and inverter manufacturers. This limits the selection of manufacturers to only those which are approved by EDF Power Solutions UK .

5.2.2. EDF Power Solutions UK has a world class Research and Development (R&D) team and facilities that support this process. In 2020, EDF invested €685 million in R&D. EDF Power Solutions UK has undertaken a range of studies as part of the development of its global battery portfolio. As part of this work EDF Power Solutions UK New Technologies Team along with EDF R&D work with manufacturers and integrators to develop world leading battery systems.

5.2.3. EDF Power Solutions UK only considers and engages with suppliers and products that conform to ISO 9001, UN 38.3, CE and local regulation, auditing both technical and financial aspects. The manufacturing facilities are inspected, and production lines are monitored. Production quality documentation is checked and on the production line it is verified that the quality requirement is correctly respected and implemented. The following aspects are specifically checked:

- Material management.
- Procurement and supplier management.

- Manufacturing processes.
- Quality system.
- Reliability program.
- Training.
- Corrective action and non-confirming process and process improvements.
- Corporate social responsibility, environmental, health and safety.

5.2.4. Battery samples are also randomly selected from factories and tested in the EDF R&D laboratory in order to validate the reliability, safety and performance of products.

5.2.5. It is recognised within EDF Power Solutions UK that a robust quality process is a wise investment at the development and procurement stages that pays large dividends in terms of safe, continuous operation.

Testing

5.2.6. The system selected would be tested in accordance with UL 1973 (2022 edition), UL 9540, UL 9540A, IEC 62619 and UN 38 or equivalent. This would determine the propensity of the system to suffer from thermal runaway at either cell, module or rack level. The electrochemistry in the example design of the BESS used to inform the ES is LFP (Lithium-ion Phosphate). The assumption of using LFP serves as a reasonable worst-case scenario for safety assessments.

5.2.7. The example BESS modules used to inform the ES have been assessed to UL 9540 and UL 9450A. The system satisfied UL 9540A criteria at Module level.

5.2.8. The module tests showed that during testing, no fire or explosion occurred, and the thermal runaway did not propagate to the adjacent cells. Other testing certificates are to be requested from the supplier. The Applicant would only consider bids from suppliers that demonstrate no module-to-module propagation during testing.

5.2.9. As a minimum, the battery system will have completed unit or installation level UL 9540A (5th Edition) testing (Ref), the BESS design will have completed large scale fire testing (LSFT) to demonstrate that loss will be safely limited to one BESS enclosure without the intervention of Fire Fighters. NFPA 855 (2026 revision) mandates that Large Scale Fire Testing (LSFT) which is full scale burn testing of the BESS system to validate safe equipment spacing, must be conducted and the BESS selected at detailed design must as a minimum have completed this testing under the UL 9540A test program or an accredited 3rd Party LSFT test program i.e. CSA, DNV, TUV SUD, etc The Applicant conducts testing of cells under abusive conditions to further analyse the off gases produced during cell venting in the event of thermal runaway. This testing provides critical input in understanding the volume of off gases which are likely to be produced. Once the battery modules for the Proposed Development have been selected, appropriate steps to mitigate the impacts would be identified. In addition, the Applicant has carried out a **BESS Plume Assessment [EN010158/APP/7.13]** to assess the impacts of a thermal runaway event for an example battery cell.

5.2.10. Another plume assessment would be completed once the battery modules for the Proposed Development have been selected at Detailed Design to demonstrate that the risk of thermal runaway and impacts from such thermal runaway will be no worse than as assessed in the plume assessment submitted with the Application. This informs the design prior to construction and ensure specific battery chemistries are considered along with all appropriate safety mitigation measures being put in place.

5.3. Safe BESS Design

5.3.1. The BESS would be designed to address prevailing industry standards and good practice at the time of design and implementation. BESS system and components used to construct the facility will be certified to UL 9540 (2023) and/or BS EN IEC 62933-5-2 standards (or any future standards which supersede this).

5.3.2. The current industry standard is NFPA 855, Standard for the Installation of Stationary Energy Storage System and the Applicant also requires any system selected to comply with UL 9540A, Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems which demonstrates the fire propagation for lithium-ion batteries at cell, module and unit level.

5.3.3. In addition to this, the NFCC's "Grid Scale Battery Energy Storage System planning – Guidance for FRS" has been reviewed with regards to site layout and separation distances for the transformers and inverters.

5.3.4. Fire safety provisions typically found within battery system design are as follows:

- Battery modules with safety features designed into the cell level such as:
  - Internal fuses.
  - Protection devices to isolate BESS at rack/ string and bank level.
  - Overcharge safety device.
  - Internal separating layers.

– Venting device
– Thermal Monitoring.

5.4. System Location

5.4.1. Within the Site the selection of the location of the BESS has been based on a number of factors. The most pertinent factor being the minimisation of the proximity to receptors of any nuisance with the distance to properties maximised where possible. This has the benefit of reducing the visual and noise impacts but also minimises any potential impacts on the local population should an event occur. The location of the proposed BESS is shown on the **Works Plans [EN010158/APP/2.3].**

5.5. System Layout

5.5.1. An illustrative layout for the BESS Facility is included in the **Illustrative Layout Plans & Sections [EN010158/APP/2.6].**

5.5.2. The layout of the system would provide separation between key components or groups of key components. Separation would follow the NFCC guidance in place at the time, with amendments (where permitted under the NFCC guidance) to align with other guidance such as NFPA 855:

- The BESS would be arranged into discrete groups consisting of battery enclosures and other infrastructure such as switchgears and transformers.
- Final BESS design and site layout will be validated through mandatory Large Scale Fire Testing (LSFT) and rigorous site specific consequence modelling to minimise the requirement for BFRS intervention in a thermal runaway incident. LSFT must establish minimum equipment spacing distances that demonstrate there is no fire propagation to adjacent BESS enclosures or other infrastructure equipment. The example design which has been used to inform the ES uses a minimum separation of 3.5m which is in line with NFPA 855 guidance for a “Remote Installation”.
- The distance between the battery enclosures and Order Limits boundary in the example layout used to inform the ES is a minimum of 40m. This exceeds the current NFCC guidance of 30 metres.
- The separation of the inverters and transformers would, depending on the architecture, be optimised at detailed design stage to minimise the likelihood of any spread of fire between adjacent components. The example design used to inform the ES employs a distance of 6.9 metres between each Medium Voltage Power Station (MVPS), and 3.5 metres between the MVPS and BESS Enclosures.

- Note that inverters & transformers could be placed on adjustable legs or metal skids, in which case the separation of the group from the BESS would be considered.
- NFPA 855 recommends that areas within 3m of the BESS equipment are kept free of vegetation or other combustible material that could act to spread a fire. In contrast, NFCC guidance recommends that the BESS equipment maintains a 10-metre clearance from vegetation or other combustible materials. Design of the Proposed Development would comply with NFCC guidance by specifying that areas within 10m of BESS equipment would be finished with gravel or other non-combustible surfacing.

5.5.3. NFPA 855 recommends the following separation distances for BESS located outdoors:

- BESS should be separated by a minimum of 3m from the following:
  - Site boundaries (described as “Lot lines” in NFA 855).
  - Public ways.
  - Buildings.
  - Stored combustible materials.
  - Hazardous materials.
  - High-piled stock.
  - Other exposure hazards not associated with electrical grid infrastructure.

5.5.4. FM Global Datasheet “5-33 Lithium-ion Battery Energy Storage Systems” recommends a separation distance of 1.5 metres between BESS enclosures.

5.5.5. This means that in the unlikely event that all of the system design mitigations and preventative measures fail that should a fire occur, it would be limited to the part of the system that is on fire, i.e., the overall size of the battery system is inconsequential to the outcome; an event should be limited in size to only that equipment within a group, whether there are one or any number of groups.

5.5.6. The example BESS compound layout that has been used to inform the ES allows for large articulated HGV and fire rescue vehicles, including suitable road widths, turning radii and at least two suitable access points, with one of the access points in the prevailing wind direction. The layout is shown in **Illustrative Layout Plans & Sections [EN010158/APP/2.6].** A vehicle tracking assessment has been carried out to validate the layout’s compliance.

5.5.7. The Applicant has carried out a **BESS Plume Assessment [EN010158/APP/7.13]** to understand how, in the event of a fire, site access would be affected , the potential consequences of the BESS failure and the impact on surrounding areas and receptors. The objective is to assess potential impacts on emergency responders, site personnel, and the public in surrounding areas during a worst-case emergency event involving battery thermal runaway or fire. Access for fire rescue vehicles has been discussed between the Applicant and Buckinghamshire and Milton Keynes Fire Authority as detailed in **Statement of Common Ground – Buckinghamshire and Milton Keynes Fire Authority [EN010158/APP/5.17],** which would be incorporated into the detailed design.

5.6. BESS Enclosures

5.6.1. BESS Enclosures house the energy storage electrochemical components and associated equipment. The example design used to inform the ES uses multiple enclosures closely coupled to form a complete system. They would be mounted on a concrete pad or directly on compacted hardcore.

5.6.2. The BESS Enclosures would be designed and constructed by the manufacturer in accordance with good practice available at the time, such as UL 9540 and/or BS EN IEC 62933-5-2 certificated and align with guidance outlined in the NFPA 855 - Standard for the Installation of Stationary Energy Storage Systems.

5.6.3. The BESS Enclosures would be locked to prevent unauthorised access and would have a minimum internal fire rating of one hour (according to NFPA 855, BR 187 and FM Global Datasheet 5-33).

5.7. Fire Detection and Suppression

5.7.1. In order to achieve the safety objects, the BESS Facility would employ detection and monitoring equipment that would help identify any abnormal operation and safely shutdown the affected BESS equipment before the conditions develop further. Detection and monitoring equipment would be independent of the control systems that can cause abnormal events and avoid the use of Safety Integrated Level (SIL) rated risk controls. At the detailed design stage, once BESS equipment has been selected, the Applicant would develop the management plan in accordance with relevant standards and guidance to define measures applicable to the selected BESS Enclosures. These may include:

- Thermal monitoring of the BESS enclosures and automated cut-out beyond safe parameters.
- Battery cooling systems with automated fail-safe operation.

- Emergency Stop – both remote and local. This includes at BESS Facility, BESS Enclosure and MVPS level.
- Fire detection suitable to the architecture such as:
  - Very early smoke detection by aspiration (VESDA) system.
  - Gas detection such as H_2 and CO, as an early indication of cell failure.
  - Standard heat and smoke detection system.
- Fire suppression such as:
  - a dedicated water-based suppression system may be provided within each BESS Enclosure designed to control or fully suppress a fire, without the intervention of the FRS. NFPA 855 confirms that water is the most effective battery fire suppression agent. The suppression system must be capable to operate effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks.
  - If the BESS design does not integrate automatic fire protection systems or TRPP systems and a dry pipe sprinkler or spray system is integrated, then NFCC (2025) revised guidance will be followed. Connections to any dry pipe systems that are required to be installed on the BESS Area will be installed in accordance with BS 9990 Non-automatic fire fighting systems in buildings code of practice (Current Edition) and will be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (Current Edition). If a dry pipe system is integrated for the Proposed Development, FRS instantaneous connection points will be located at a safe distance from enclosures and clearly signed for FRS response, in accordance with NFCC guidelines. Water supply for this type of system will be separate from the water supply designated for FRS boundary cooling firefighting requirements.

5.8. Explosion Detection and Protection

5.8.1. The Proposed Development would meet required safety objectives for explosion detection and protection specified in NFPA 855 incorporating in NFPA 68 – Standard on Explosion Protection by Deflagration Venting and NFPA 69 Standard on Explosion Prevention Systems. Together, these standards provide comprehensive guidelines and standards to manage and mitigate explosion risks in BESS facilities. BESS equipment and site design compliance with NFPA 68 and NFPA 69 are crucial for protecting both site personnel and property from incidents relating to explosions.

5.8.2. The selected BESS enclosure used would feature a ventilation system to expel vented flammable gasses that are produced in abnormal operating conditions (for example thermal runaway). An in-built hydrogen sensor would trigger the ventilation system to purge the gases within the enclosure.

5.8.3. NFCC guidance is that BESS enclosures should be fitted with explosion protection or deflagration venting appropriate to the hazard and battery technology deployed. The Proposed Development would consider the option of using roof mounted deflagration panels that are compliant with the design, installation and maintenance requirements of NFPA 68. This would reduce the risk of injury to site personnel and reduce the risk of damage to the affected BESS enclosure, surrounding BESS equipment and infrastructure. Where emergency ventilation is used to mitigate an explosion hazard, the isolation for the ventilation system would be clearly marked to notify personnel or first responders to not disconnect the power supply to the ventilation system during an evolving incident. Additionally, the remaining unaffected cells would continue to be maintained within their operating temperature.

5.9. Safe BESS Construction

5.9.1. The BESS would be constructed in two distinct phases. Firstly, the civil works and balance of plant equipment would be started. Then at a suitable point the BESS equipment would be delivered to be installed on the foundations and connected up to the balance of plant.

5.9.2. The installation would be subject to pre-requisites such as a contractor emergency protocol detailing the actions to be taken in an emergency, including an emergency response plan that would be coordinated with the relevant stakeholders and emergency services. In addition, installation would not take place until practical provisions were completed such as the water tanks and associated water delivery system being installed and filled for use in an emergency.

5.9.3. The transportation of the system from the factory would be a combination of sea and land freight. The system would be certified for transportation in all potential environmental conditions. The equipment would be certified for transport to UN 38.3. Transportation would be managed in accordance with the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) 2019 and the UK guidance on the transport of dangerous goods “Moving dangerous goods, Guidance” webpage.

5.9.4. The equipment supplied would be fully tested including Factory Acceptance Testing (FAT). By definition the FAT testing would be undertaken away from site reducing the risks during on site construction with visual inspections and functional testing undertaken before any Site Acceptance Testing (SAT). The Site installation would be supervised by the Original Equipment Manufacturer and carried out in a hierarchical way to ensure that all necessary systems are available before the next step is required. By following a logical sequence of works with each step being built upon the preceding one, the system can be safely assembled without risk and all mitigations against issues in place before the next step.

5.10. Safe BESS Operation

Control Room

5.10.1. The BESS would be monitored by the onsite control systems as well as 24/7 monitoring by a remote-control room.

- All staff would be fully trained and familiar with the technology.
- The control room would also be responsible for the security of the BESS site with state-of-the-art detection and monitoring systems. These can be repurposed in an emergency to support first responders.
- The control room would have the ability and authority to immediately shut the system down should the need arise.
- The control room would be responsible for the implementation of the emergency plan acting as a point of contact to emergency services.
- The BESS facility would have signage in accordance with the relevant Electrical Regulations but would also have the control room emergency telephone number should a member of the public or emergency services need to make contact.

Control Architecture

5.10.2. Different battery systems have different topologies of control and safety systems that extends all the way to, in some measures, cell level however it is likely that the final selected system would have:

- A module monitoring system.
- Each rack or string would typically have a rack/string monitoring system, receiving information from each module.
- Each bank would have a monitoring system, receiving information from each rack/string.
- A battery management system (BMS) with built in fail-safe automated algorithms.

5.10.3. The battery system components communicate with a master controller(s) that reads and records this information and uses algorithms to enable the safe operation of the system within these parameters.

5.10.4. These control systems would be failsafe by design with automatic shutdown of parts, or of the whole system, depending on circumstance.

5.10.5. The BMS would identify any failed cells and disconnect them, reducing the risk of a minor cell failure escalating to a failure of cell electrolyte containment. Individual cells would also be enclosed in battery banks, providing secondary containment, with the battery banks then enclosed in 'cubes' or shipping container, providing tertiary containment against pollution.

5.11. Security

5.11.1. The site security profile would be assessed by the Applicant's dedicated security team and the output from this assessment would inform the level of security measures used.

5.11.2. The BESS area will have security fencing with a minimum of two points of ingress/egress for first responders and will be clearly signed, with incident emergency response contact details, clear identification of BESS Area hazards, details of site access arrangements such as key codes, which will be provided to BFA.

5.11.3. The site would also have high quality CCTV with video analytics to identify issues and detect unauthorised access. This enables the correct security response to be undertaken by the control room.

5.11.4. Suitable lighting and sensors would be implemented around the Springwell Substation and BESS compound.

5.11.5. Cybersecurity would form a fundamental part of the system design and architecture. Standards such IEC 62443 and guidance from sources such as National Cybersecurity Centre would inform the implementation and protection measures, reference shall be made to the HSE Operational Guidance document OG86.

5.12. Maintenance

5.12.1. The BESS facility would be maintained and operated by skilled personnel ensuing that the system is in optimal condition and that all parts of the system are fully serviced and functional at all times.

5.12.2. Maintenance is likely to be undertaken on the BESS equipment twice a year. This typically consists of a major maintenance period and a minor maintenance period. The major is relatively non-intrusive and involves checking connections and inspections from the transformer down to the module level. This would encompass all BESS equipment supplied by the original Equipment Manufacturer including the fire system. The minor maintenance is typically a visual inspection and rectification of any accumulated non-critical defects.

5.12.3. All maintenance would be undertaken in a carefully controlled manner following the site safety rules. The detail of this maintenance will be included in the detailed Battery Safety Management Plan once the detailed design of the Proposed Development has been completed.

5.12.4. During operation all works on the site would be controlled under safe systems of work. This would mean all work is risk assessed to protect both personnel and equipment. Therefore, safety systems such as fire systems would not be stopped or taken out of service without appropriate mitigation, following the system being made safe so far reasonably practicable, and only for the minimum time required to undertake any specific maintenance tasks.

5.12.5. The operation of the BESS facility would be managed in accordance with the OEMP.

5.13. Battery Augmentation

5.13.1. During the operational phase, from time to time there may be a requirement to replace or augment the battery system due to equipment failure or degradation of the system capacity. Note the planned design life may require replacement or augmentation of the battery systems on more than one occasion depending on use case.

5.13.2. The risks associated with any wholesale replacement with similar or any new technological developments would also be considered before any works commence. It is also possible that any replacement or augmentation of the system may use a contemporary equivalent of the original BESS equipment. Any modifications would be subject to the Applicant's Management of Change process applying the same or similar principles to those laid out in this document.

5.14. Decommissioning

5.14.1. All BESS Facility decommissioning would be undertaken in a carefully controlled manner following the site safety rules and in accordance with the Decommissioning Environmental Management Plan (DEMP) which would be prepared in accordance with the **Outline Decommissioning** Environmental Management Plan [EN010158/APP/7.4]. The BESS site protection for firewater segregation will remain in place until the BESS has been removed from site during the decommissioning phase. The **Outline DEMP [EN010158/APP/7.4.2]** provides more detail on this.

6. Firefighting

6.1. Overview

6.1.1. This section sets out information on the firefighting strategy, including:

- Fire service access.
- Firewater (inc. runoff and safeguarding of water bodies/ land quality and groundwater).
- Fire equipment.
- Emergency planning.
- Firefighting consequences.

6.1.2. The Applicant has engaged with Buckinghamshire Fire Authority throughout the pre-application phase on the topics discussed in this section. Outcomes of this engagement are detailed in the **Statement of Common Ground - Buckinghamshire and Milton Keynes Fire Authority [EN010158/APP/5.17].**

6.2. Fire Service Guidance

6.2.1. Guidance for the Fire Service for dealing with sites such as powerplants, substations etc is contained in the National Operational Guidance (NOG), under Utilities and Fuel.

6.2.2. The Fire Service Manual stipulates that in all cases involving electrical apparatus, it is essential to ensure, on arrival, that the apparatus is electrically isolated and safe to approach. This should be carried out by the operator at the premises concerned. It is strongly advised that electrical or associated equipment should not be touched or even approached unless it is confirmed to be isolated and safe.

6.2.3. In the event of a fire, the battery system and the transformers serving the BESS would be automatically electrically isolated when a fire is detected within a container. However, the batteries within the enclosures would still hold charge in the event of a fire, even after the electrical system is isolated. It would not be possible to confirm that there is no residual risk from the energised batteries within the container, and this would inform the strategy for firefighting in the emergency response plan.

6.3. Emergency Response Plan

6.3.1. Prior to commencement of the construction of the BESS, an emergency response plan would be prepared by the Applicant in consultation with Buckinghamshire and Milton Keynes Fire Authority and other relevant stakeholders. This would be maintained and reviewed regularly throughout the operating life of the BESS. The plan would be developed in accordance with NFCC guidance and other guidance and good practice in place at the time. The Emergency Response plan would include a commitment to notify the Environment Agency should an on-site thermal runaway event occur.

6.3.2. The Applicant has listed current UK National Fire Chiefs Council (NFCC) and NFPA 855 recommended ERP minimum content guidelines that the emergency response plan would cover:

- How the fire service will be alerted and incident communications and monitoring capabilities.
- Facility description, including infrastructure details, operations, number of personnel, and operating hours.
- Site plan depicting key infrastructure:
  - i. Site access points, internal roads, agreed access routes, observation points, turning areas, etc.
  - ii. Firefighting facilities (water tanks, pumps, booster systems, fire hydrants, fire hose reels etc).
  - iii. Water supply locations and capacity.
  - iv. Drainage and water capture design and locations.
- Up-to-date contact details of the emergency response co-ordinator including the subject matter expert (SME) for the Order Limits.
- Safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems
- Details and explanation of warning systems and alarms on site and locations of alarm annunciators with alarm details (smoke, gas, temperature).
- Hazards and potential risks at the facility and details of their proposed management.
- The role of the FRS at incidents involving a fire, thermal event or fire spreading to the Order Limits.
- Emergency shutoff or isolator locations.
- A list of dangerous goods stored on site.
- Site evacuation procedures.
- Site operation Emergency Management protocols - 4 phases: discovery, initial response/notification, incident actions, resolution and post incident actions/responses

- Emergency procedures for all credible hazards and risks, including building, infrastructure and vehicle fire, wildfires, impacts on local respondents, impacts on transport infrastructure.
- The operator will develop a post-incident recovery plan that addresses the potential for reignition of the BESS and de-energizing the system, as well as removal and disposal of damaged equipment.

6.3.3. The emergency response plan would also cover these eventualities;

- The duration of dwell for any site personnel, responder or member of the public would be controlled (minimized) to reduce the exposure time & concentration.
- This may include installation of visual e.g. beacons and/or audible e.g. klaxons alarms to alert onsite & offsite personnel of a venting event. The site is remote (with few members of the general public in the vicinity), therefore beacons/klaxons may be of limited value for those not aware of the hazards the site may present.
- This may include installation of a met mast or other relevant system on the site to measure wind speed and direction so that this can be shared in real-time with emergency responders and others to inform relevant and effective emergency response.
- As would be the case in any fire event, relevant nearby properties in the downwind direction would receive recommendations for people to remain indoors and keep doors and windows closed to further reduce any impact. The nearest property is approximately 400m from the proposed BESS location. A plume assessment has considered the potential impacts from all types of battery failures, finding that in the occurrence of credible worst-case scenarios, nearby receptors are likely to remain unaffected relative to thresholds outlined in existing guidance. See **[BESS Plume Assessment – EN010158/APP/7.13].**
- A site cordon/exclusion zone would be in place;
- This may extend to the Public Rights of Way (PRoW) to the west however dwell times in the smoky plume would need to be reasonable for any impact on receptors and the smoke would serve to encourage people to avoid the area.
- The immediate downwind areas would be investigated for casualties.
- It is anticipated that the emergency response would take no more than a few tens of minutes to attend site, meaning that only incapacitated people in the immediate vicinity (within the site) would be at significant risk during this time. Discussions regarding the emergency response are ongoing with the Fire Authority.
- The Highways Agency would be alerted in the event of a fire (or other major incident) at the BESS location and take appropriate actions.

- A Risk Management Plan would be developed with BFA post consent at the detailed design stage which, as a minimum, will provide advice in relation to potential emergency response implications including:
  - The hazards and risks to the facility and their proposed management.
  - Any safety issues for firefighters responding to emergencies at the BESS facility.
  - Safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems. Establish response times and site arrival protocols.
  - The adequacy of proposed fire detection and suppression systems e.g. water supply on-site.
  - Natural and built infrastructure and on-site processes that may impact or delay effective emergency response i.e. firefighting water runoff capture.

6.3.4. Further detail on the effects of any fire event on receptors and the general public is included in the **BESS Plume Assessment [EN010158/APP/7.13].**

6.4. Fire Service Access

6.4.1. Access would be designed such that emergency services are able to access the site easily with site roads being clearly laid out and signed in accordance with the following:

6.4.2. Firefighting access would be designed in accordance with guidance of Approved Document B (ADB). Although ADB is not applicable as this site is not covered under the building regulations it provides useful access road specifications which are outlined in Table 1 below. It should be noted that vehicles differ across the UK for different fire and rescue services and access specifications would be considered in detail with Buckinghamshire Fire Authority.

6.4.3. Turning facilities would be provided in any dead-end access route that is longer than 20m.

Table 1- Typical Fire and Rescue Service Vehicle Access Route Specification

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	14.0
High Reach	3.7	3.1	26.0	29.0	4.0	23.0

6.4.4. The example design used to inform the ES uses a minimum proposed access road width to reach the BESS Facility of 4m, i.e. in excess of the minimum value in Table 1.

6.5. Firefighting Water

6.5.1. The example design used to inform the ES includes four large water tanks, each with approximately 113,000 litres (l) of water. This would provide 1,900 litres per minute for approximately 4 hours of water which is approximately double the 2-hour minimum duration stated in current NFCC guidance.

6.5.2. Water storage tanks will be located at least 10m away from any BESS enclosure. They would be clearly marked with appropriate signage. They would be easily accessible to BFA vehicles and their siting would be considered as part of a risk assessed approach that considers potential fire development/impacts. Outlets and connections would be agreed with BFA. Any outlets and hard suction points would be protected from mechanical damage (e.g. through use of bollards).

6.6. Fire Equipment

6.6.1. Additional firefighting equipment would also be provided on the site to assist with emergency operations.

6.6.2. Weather stations would be installed to identify the weather conditions in an emergency situation. This would allow the fire service to approach from a safe direction; communication with the Buckinghamshire and Milton Keynes Fire Authority would be agreed and described within the Emergency Response Plan.

6.6.3. Other firefighting or emergency equipment such as additional fire hose to be stored onsite would be agreed with Buckinghamshire Fire Authority prior to the commencement of construction.

6.6.4. As the BESS Facility operatives would only have occasional limited access into the battery enclosures (for maintenance), there is unlikely to be any immediate threat to life, only to the property which forms part of the Proposed Development.

6.6.5. Following liaison with Buckinghamshire and Milton Keynes Fire Authority and Anglian Water Services Limited, water required by the emergency services would be brought to site by tanker or bowser (initially during the construction phase) and stored in dedicated tanks ready for use in an event. Details can be found in the **Statement of Common Ground - Buckinghamshire and Milton Keynes Fire Authority [EN010158/APP/5.17]**.

6.6.6. Buckinghamshire Fire Authority are most likely to manage any BESS Enclosure fire by using water on neighbouring areas such as battery enclosures, trees and structures to cool down and prevent further fire spread. Therefore, it is not anticipated that firefighting techniques would involve direct jets of water onto burning equipment and would be limited to containment and cooling of adjacent units to prevent the fire from spreading. This strategy would be finalised with the local fire authority and would be made clear in the emergency response plan.

6.6.7. As set out in the **Outline Drainage Strategy** (which forms an appendix to the **Flood Risk Assessment [EN010158/APP/6.4]**), an example approach to Rosefield Solar drainage could include a separate system around the BESS to collect water runoff into an attenuation/ storage pond. The design will incorporate appropriate containment measures within drainage features and storage components to ensure a sealed and isolatable system; this will ensure that the pathway between retained fire water and the receptors is blocked, ensuring that the water doesn't infiltrate the ground and move to the surrounding receptors. No specific materials or configurations have been prescribed at this stage to allow flexibility within the design but the requirement for a controlled and contained system is included. This system could have automatic and manual isolation systems to ensure that any firewater runoff is captured for analysis prior to disposal. Following a fire event, retained water would be tested by the operator. Samples will be taken, when safe to do so, and sent to a UKAS accredited laboratory using MCERTS accredited methods where applicable. The water will be checked against the list of surface water specific substances in the surface water pollution risk assessment guide, in consultation with the Environment Agency. If contaminated (polluted), the water would be removed from site by tanker for treatment at an appropriately licensed offsite facility. If testing confirms that the water is suitable for discharge or reuse, it would be released to the local drainage network under controlled conditions, in consultation with the relevant regulators and potential water discharge permit or reused as a potential source of firefighting water by re-filling the water tanks. This follows the management plan process as detailed in "Protocol for the disposal of contaminated water and associated wastes at incidents 2018" jointly issued by the Environment Agency, Northern Ireland Environment Agency, Water UK and Chief Fire Officers Association.

6.6.8. The automatic and manual isolation systems would be subject to regular operational maintenance to ensure the reliability of the firewater isolation system in a flood event. The detail of this maintenance will be included in the detailed Battery Safety Management Plan once the detailed design of the Proposed Development has been completed.

6.6.9. This approach ensures that environmental protection is maintained under both normal and emergency conditions. The water tanks would be maintained and cleaned at regular intervals with any silt collected during post fire event, also tested and transported offsite if required. Following a fire event, the aggregate subbase below the BESS units would be evaluated for contamination and reinstated to maintain the integrity of the site's drainage infrastructure. Details of the testing and replacement procedures would be included in the detailed Battery Safety Management Plan. UK accredited labs would be used for water testing.

6.6.10. A post event action plan would be drawn up that would determine any immediate and follow up actions required to an event including an assessment in general accordance with LCRM (Land Contamination: Risk Management) and BS 10175:2011+A2:2017 (Investigation of potentially contaminated sites – Code of practice).

6.6.11. There are many factors which would inform the design of an investigation following an incident which ultimately account for the volume and concentration of the loss. In the case of a fire to a BESS unit, variables to be considered include:

6.6.12. Extent of the fire: including duration, number of BESS units impacted, number of adjacent assets impacted.

6.6.13. Firefighting method: whilst defensive techniques are anticipated, larger volumes of water may be required to dampen and cool adjacent assets, alternative techniques to fight any adjacent fires.

6.6.14. Location of fire: adjacent to drainage or close to soft ground.

6.6.15. Existing site conditions: recent weather and precipitation levels.

6.6.16. The final BESS design would allow for potential evolution in good practices or technologies which might require different firefighting techniques to be used by the time the development is built (e.g. replacing firefighting water with another product/technique). This may also change the required drainage solution. However, the principles that have been committed to within this plan, such as firewater segregation, contamination testing and disposal will still apply.

7. Pre-Construction Information Requirements

7.1.1. The detailed design phase would consider the lifecycle of the battery from cradle to grave. A large number of studies would be undertaken, with a focus on fire risk including, but not limited to, studies in line with risk analysis and management tools such as Hazard and Operability Analysis and Hazard Identification (HAZOP/HAZID), failure Mode and Effects Analysis (FMEA), Bowtie risk assessments and Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) to inform the overall design solution. An agile method is applied during the engineering design phase for fire safety analysis. The analyses are updated based on any changes of the Proposed Development context and during the design process from the selected contractors in case of any deviation from the initial set of technical requirements. These would be finalised before construction commences.

7.1.2. As recommended in NFCC guidelines (2024) a detailed BESS system and site-specific Plume Analysis and Atmospheric Dispersion will be conducted to assess the environmental impact of a site incident to sensitive receptors within a 1 km radius using the Rosefield confirmed BESS system supplier data. When the battery system of a BESS is fully consumed (burnt out), toxic gas, particulate matter and other relevant products of combustion emissions with the potential to impact sensitive receptors will be assessed against relevant public health/toxicological guideline values, such as UK Air Quality Objectives, WHO Air Quality Guidelines, or AEGLs. The plume study will also include a visibility impact assessment on any transport links within a 1 km radius of the BESS area. This detailed Plume Study will be in addition to the early plume studies that have been carried out for the Proposed Development. **BESS Plume Assessment [EN010158/APP/7.13].**

7.1.3. The detailed design phase would determine the approach to addressing the following specific requirements, which would be updated prior to construction of the BESS facility and submitted to the local planning authority as a detailed BSMP prior to the commencement of construction. The detailed BSMP must include:

- The detailed design, including drawings of the BESS facility.
- A statement on the battery system specifications, including fire detection and suppression systems.
- A statement on operational procedures and training requirements, including emergency operations.
- A statement on the overall compliance of the system with applicable legislation.

- An environmental risk assessment to ensure that the potential for indirect risks (e.g., through leakage or other emissions) is understood and mitigated using methods consistent with Best Available Techniques (BAT) in relation to the specific battery chemistry selected.
- An emergency response plan covering construction, operation and decommissioning phases developed in consultation with Buckinghamshire Fire Authority and other relevant stakeholders, to include the adequate provision of firefighting equipment onsite.

7.1.4. Provision of the above information would demonstrate prior to construction that all of the considerations and requirements in this document have been addressed and the BESS installation is safe.

7.1.5. Safe decommissioning of the BESS facility would be addressed prior to decommissioning of the Proposed Development in the final version of the Decommissioning Environmental Management Plan (DEMP) approved in accordance with the **Outline Decommissioning Environmental Management Plan [EN010158/APP/7.4].**

8. Conclusion

8.1.1. The Applicant is committed to developing a safe BESS facility that would provide long and dependable operation. It is in everyone's interest that the selected BESS technology is robust, with regards to safe operation.

8.1.2. This outline plan demonstrates that as well as the Applicant having significant internal expertise and robust processes in BESS development, the relevant stakeholders have been consulted and their responses have informed the design of the Proposed Development, and therefore safety would be inherent in the overall design, minimising the risk of a fire event occurring, and reducing the impact of such an event should it occur.

8.1.3. This outline plan provides a clear list of pre-construction information requirements (Section 5) to enable the Applicant to demonstrate prior to construction that the Proposed Development would be implemented and operated safely.

9. References

- NFPA 855 (United States of America) - Standard for the Installation of Stationary Energy Storage Systems.
- BS EN 14797 (2006): Explosion venting devices
- NFPA 68 – Standard on Explosion Protection by Deflagration Venting
- NFPA 69 – Standard on Explosion Prevention Systems
- NFPA 2010 – Standard for Fixed Aerosol Fire-Extinguishing Systems
- UL 9540A Testing Compliance - Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.
- NFPA 2010 – Standard for Fixed Aerosol Fire-Extinguishing Systems
- UL 1973 (2022) - Batteries for Use in Stationary and Motive Auxiliary Power Applications.
- UL 9540 3rd Edition (2023) - Standard for Energy Storage Systems and Equipment.
- BS EN IEC 62619 (2017) Secondary cells and batteries containing alkaline or other non-acid electrolytes. Safety requirements for secondary lithium cells and batteries, for use in industrial applications.
- National Fire Chiefs Council (NFCC): Grid Scale Battery Energy Storage System Planning – Guidance for FRS (United Kingdom).
- FM Global Property Loss Prevention Data Sheets: 5-33 Lithium-Ion Battery Energy Storage Systems (United States of America).
- DNV GL-Recommended Practice-0043: Safety, Operation and Performance of Grid-Connected Energy Storage Systems, 2017.
- BS 5839 Part 1 2017: Fire Detection and Fire Alarm Systems for Buildings.
- The Regulatory Reform (Fire Safety) Order (RRO) 2005.
- IEC 61936, Power installations exceeding 1 kV AC and 15 kV DC – AC.
- The Buildings Regulations 2010, Approved Document B (Fire Safety) – Volume 2. Adopted provisions can be found within section 2.4.
- UN 38.3: Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria – (Lithium Metal and Lithium-Ion Batteries).

Rosefield

Solar Farm

rosefieldsolarfarm.co.uk

Application Document Ref: EN010158/APP/7.9.34
Planning Inspectorate Scheme Ref: EN010158