Stonestreet Green Solar

Outline Battery Safety Management Plan (Tracked)

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1 Executive Summary

1.1.1 ThisThe original version of this outline Battery Safety Management Plan ('Outline BSMP') has beenwas prepared on behalf of EPL 001 Limited ('the Applicant') by Ove Arup & Partners Limited. It Following submission of the DCO Application it has been updated to incorporate updated draft guidance from the National Fire Chiefs' Council ('NFCC'), published post submission of the DCO Application, and further technical input from BST+T Consultancy Services.

1.1.11.1.2 This Outline BSMP provides an overview of the key provisions to be adopted in order to ensure fire safety during construction, operation and decommissioning of the Battery Energy Storage System ('BESS') which is to be installed in relation to Stonestreet Green Solar ('the Project').

1.1.21.1.3 This Outline BSMP provides a summary of the proposed approach to battery safety management by reference to the safety systems available and best practice procedures today. It is likely that by the time of construction other battery technologies or risk reduction approaches may have advanced and the BSMP produced prior to construction will be updated to include these as appropriate.

1.1.31.1.4 The key fire safety principles to be included are as follows:

- The BESS will be designed, selected and installed in accordance with related standards, international guidance and good practice.
- The BESS will be designed with multiple layers of protection to minimise the chances of a fire or thermal runaway. This will include integrated fire detection with automated suppression systems to deal with electrical fires. Following Best Practice (e.g., NFPA 855[1]) the build-up of explosive gases will be avoided by gas venting.
- RiskDetailed risk assessments and consequence modelling will be carried out for the entire system during construction and for the operational life of the BESS.
- The BESS will be distributed across the 192ha Site, typically in groups of four with a maximum grouping of eight BESS Units in any one area, as opposed to a single site location for all BESS Units.
- Separation distances between components will be in accordance or exceed best practice requirements, currently as per NFPA 855.
- All equipment will be monitored, maintained and operated in accordance with manufacturer instructions, with Kent Fire and Rescue Service ('FRS') alerted in the event of an incident.
- A dedicated emergency response team shall be identified and an emergency response plan ('ERP') will be put in place.

1.1.41.1.5 It is noted that there are several battery storage technologies available today and improvements in technology are anticipated prior to Project construction. The

final battery chemistry will be ~~selected~~confirmed as part of the detailed design prior to the commencement of construction.

~~1.1.5~~1.1.6 This Outline BSMP will provide the framework for a detailed BSMP to be prepared. The **Draft Development Consent Order ('DCO') (Doc Ref. 3.1)** includes a Requirement that secures the submission to and approval by the local planning authority of a BSMP before the commencement of the BESS. The Requirement provides that the BSMP must either accord with this Outline BSMP or detail such changes as the undertaker considers are required. As part of the preparation of the BSMP, the Applicant will take into account the latest good practices for battery failure detection and prevention, together with emergency response planning and training, as guidance continues to develop in the UK and around the world. The detailed BSMP will include the detailed BESS design and specification, operational procedures and training, environmental risk assessment and an emergency plan covering all stages of the Project. The BSMP will be prepared in consultation with Kent FRS~~.~~ and the Environment Agency.

~~1.1.6~~1.1.7 For the purposes of this document, it is assumed that the BESS system will be based upon lithium-ion ('LFP') battery technology that is commonly used on other sites being developed in the UK, including at the Cleve Hill Solar Park project in Kent. This is considered to be a reasonable worst case for the purposes of the assessment in terms of ~~safety.~~fire, explosion and toxic gas emission potential risk.

2 Introduction

2.1 Scope of this Outline Battery Safety Management Plan

2.1.1 This Outline BSMP document outlines the key fire safety provisions for the BESS proposed to be installed as part of the Project. The Outline BSMP identifies the key fire BESS failure prevention and mitigation safety principles and good industry practice to be adopted in order to reduce risk to life, property, and the environment.

2.1.2 Prior to the commencement of the BESS, the Applicant will be required to prepare a BSMP which must either accord with this Outline BSMP or detail such changes as the undertaker considers asare required. As part of preparation of the BSMP, the Applicant will take into account the latest good practices for battery fire detection and prevention together with emergency response planning and training, and will consult with Kent FRS and the Environment Agency. The preparation of a BSMP is secured by Requirement in the **Draft DCO (Doc Ref. 3.1).**

2.2 Background

2.2.1 The Project comprises the construction, operation, maintenance, and decommissioning of solar photovoltaic ('PV') arrays and energy storage, together with associated infrastructure and an underground cable connection to the existing National Grid Sellindge Substation.

2.2.2 The Project will include a generating station (incorporating solar arrays) with a total capacity exceeding 50 megawatts ('MW'). The agreed grid connection for the Project will allow the export and import of up to 99.9 MW of electricity to the grid. The Project will connect to the existing National Grid Sellindge Substation via a new 132 kilovolt ('kV') substation constructed as part of the Project and cable connection under the Network Rail and High Speed 1 ('HS1') railway.

2.2.3 The location of the Project is shown on **ES Volume 3, Figure 1.1: Site Location Plan (Doc Ref. 5.3).** The Project will be located within the Order limits (the land shown on the **Works Plans (Doc Ref. 2.3)** within which the Project can be carried out). The Order limits plan is provided as **ES Volume 3, Figure 1.2: Order Limits (Doc Ref. 5.3).** Land within the Order limits is known as the 'Site'.

2.2.4 The energy storage will be a BESS distributed across the 192ha Site in 26 separate BESS compounds as shown (for illustrative purposes only) on the **Illustrative Project Drawings – Not for Approval (Doc Ref. 2.6).**

2.2.5 For the purposes of this document, ita concept design has been assumedconsidered that theuses a BESS will utilisebased upon LFP lithium-ion battery technology, which is currently used on other sites being developed in the United Kingdom. LFP chemistries are generally considered to be safer than other lithium chemistries, including in terms of risk of entering into a thermal runaway event.

2.2.6 The design of the BESS and its impacts are controlled in several ways:

- Detailed design of the BESS will be completed prior to construction but must be in accordance with the **Design Principles (Doc Ref. 7.5).** The Design Principles will secure key safety principles including spacing of batteries, access, firewater provision and distance from residential receptors.
- The **Draft DCO (Doc Ref. 3.1)** includes a Requirement that prior to the commencement of the BESS, a BSMP must be submitted to and approved by the local planning authority in consultation with Kent FRS. and the Environment Agency. The submitted BSMP must either accord with this Outline BSMP or detail such changes as the undertaker considers are required. The BSMP must be implemented as approved.

2.3 Potential BESS Failure

2.3.1 BESSBattery cell failure which could lead to a thermal runaway event can be caused by manufacturing defects, (contaminants / imperfections), electrical abuse (overcharging, / over-discharging,), and physical or mechanical damage, arc flash or cooling (puncture / crushing).

2.3.12.3.2 BESS hazards for first responders in the unlikely event of a battery failure resulting in overheating, or abuse and short circuits.and thermal runaway event depend on the BESS design but are typically defined as: fire hazards, explosion hazards, electrical hazards (shock or arc flash), and chemical hazards (i.e. the release of toxic gases).

2.3.22.3.3 The Regardless of the type of failure or the cause, the main potential hazard from a failure is thermal runaway which produces a flammable vapour cloud which can lead to fire riskand ultimately, if the vapour cloud is not appropriately mitigated. This report outlines the measures included to reduce the controlled, flaming or gas venting incident scenarios and therefore this document focusses on reducing fire and explosion risks associated with the BESS and managing the impactshazard in the unlikely event that they occur. a failure occurs.

2.3.32.3.4 Other electrical systems (non-battery) associated with the BESS can carry fire risks but an aerosol or gaseous suppressant system can be employed to quickly and effectively extinguish fires that do not involve the lithium-ion batteries., however due to the extensive historic long-term deployment of these technologies such as transformers, inverters and switchgear, 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 report.

2.4 Safety Objectives

2.4.1 The safety objectives for the design of the BESS are:

- To minimise the likelihood of an event. This is the priority for mitigating the risk.

- To minimise the consequences should an event occur.
- To confine any event to the individual compound and minimise any impact on the surrounding areas.
- Automatically detect and activate the automatic prepare to tackle a fire fighting systemsincident as soon as possible, and alert Kent FRS.
- Ensure any personnel on Site can escape safely awayevacuate from the BESS area of the fire.
- Ensure that firefighters have sufficient water resources and can operate in reasonable safety and have sufficient water resources.where required.
- BESS design and site layout should minimise the requirement for direct Fire and Rescue Service (FRS) intervention in a thermal runaway incident i.e. direct hose streams or spray directly on BESS battery systems. FRS intervention in worst case scenarios would ideally be limited to boundary cooling of adjacent BESS and energy storage system (ESS) units to prevent the fire from spreading. This strategy would be finalised with Kent FRS and be clearly communicated in an Emergency Response Plan (ERP), the production of which is secured by this document.
- If the BESS system is designed to safely burn out to remove the risk of stranded energy in the battery systems, then full scale free burn testing will have been conducted to demonstrate that loss will be safely limited to one container without the intervention of Kent FRS.
- Ensure that fire, smoke, and the spread of toxic/explosive gasses do not significantly affect site operatives, first responders or occupants in surrounding buildings and areas.
- Ensure fire water run-off within the BESS areas is contained and treated.

2.5 Relevant Guidance

2.5.1 There is currently limited UK specific guidance documents and standards for BESS installations, however BESS installations are deployed globally, and the Applicant will look to incorporate guidance documents, codes and good practice from around the world in the design of the Project.

2.5.2 The Applicant will develop the BESS in accordance with all relevant legislation and good practice and following advice from subject experts. This document takes into account the recommendations of the following good practice documentation used in the UK for similar sites, including:

- NFPA 855 (2023) Standard for the Installation of Stationary Energy Storage Systems[1];
- National Fire Chiefs Council ('NFCC') Grid-Scale Battery Energy Storage System planning – Guidance for FRS (2023) ('NFCC Guidance')[2];
- NFPA 855;
- Underwriters Laboratories ('UL') 9540A (2025): Standard for Test Method for

Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems[3];

- NFPA 68 (2023): Standard on Explosion Protection by Deflagration Venting[4]
- BS EN 14797 (2007), Explosion venting devices[5]
- NFPA 69 (2024), Standard on Explosion Prevention Systems[6]
- UL 1973 (2022), Batteries for Use in Stationary and Motive Auxiliary Power Applications[7]
- UL 1642 – Standard for Lithium Batteries (Cells)[8];
- 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[9].
- 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[10]
- UN 38.3 (2023): Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria – (Lithium Metal and Lithium-Ion Batteries)[11].
- UL 9540 3rd Edition (2023): Standard for Energy Storage Systems and Equipment[12]
- FM Global, Datasheet 5-33 Electrical Energy Storage Systems, Factory Mutual Insurance Company (2024)[13]
- UK Power Networks ('UKPN') Engineering Design Standard 07-0116: Fire Protection Standard for UK Power Networks Operational Sites, 2016[14];
- DNV GL-Recommended Practice-0043: Safety, Operation and Performance of Grid-Connected Energy Storage Systems, 2017[15];
- Scottish and Southern Energy TG-PS-777: Limitation of Fire Risk in Substations, Technical Guide, 2019[16];
- BS 5839 Part 1 2017: Fire Detection and Fire Alarm Systems for Buildings[17]; and
- The Regulatory Reform (Fire Safety) Order (RRO) 2005[18].

2.6 Summary of Project Commitments

2.6.1 The Project has agreed the following commitments with Kent FRS at the date of submission of the DCO Application. These meet, or exceed, the NFCC Guidance where applicable.

Table 2.1: Summary of Project Commitments

NFCC Guidance	Project Commitment
A standard minimum spacing between units of 6 metres is suggested, noting this exceeds the NFPA 855 requirements	6m spacing between BESS Units, excluding side HVAC units.
n/a (NFCC guidance is focussed on a single BESS location with multiple BESS units)	BESS Units are not located in a single location but will be distributed across the 192ha Site, typically in groups of four with a maximum grouping of eight Units in any one location.
Minimum distance of 25m proposed between BESS units and occupied buildings/sites	BESS Units will be at least ~~150m~~200m from the nearest residential receptor ~~(c. 6x the NFCC guidance).~~ In addition each BESS compound (maximum of 8 BESS Units total) will be at least 25m from the next nearest BESS compound.
n/a (NFPA guidance)	The separation distance between the BESS Units and the outer boundary of the Order limits will be at least ~~10m which exceeds~~30m, in line with the ~~current NFPA~~NFCC draft guidance ~~of 3m.~~(2024).
The NFCC does not support the stacking of containers/units on top of one another	Only single stacked BESS Units are proposed.
At least 2 separate access points to the site to account for opposite wind directions	Two access tracks will be provided to each BESS location.
Access road finish and design to be suitable for fire service vehicles	Access roads will be at least 3.7m wide and will have a carrying load in compliance with Building Regulations and the NFCC Guidance. A swept path analysis for emergency vehicles will be undertaken and the roads must be confirmed as suitable for emergency vehicle access.
Water supply capable of delivering no less than 1,900 litres per minute for at least 2 hours is required	Each BESS compound will include a pump driven hydrant network (not gravity fed) that is connected to an on-Site water tank that will be capable of delivery in line with NFCC Guidance.
Water supplies to be located close to BESS containers (but considering safe	Water tanks to be located at least 50m from a BESS compound area.

NFCC Guidance	Project Commitment
access). Static water tanks must be located at least 10m from any BESS unit.	Hydrants to be located near to BESS Units within Works No. 2 areas. at locations to be agreed with Kent FRS. Connections to any dry pipe systems or hydrants that are required will be installed in accordance with BS 9990 Non-automatic firefighting systems in buildings code of practice (Current Edition) and will be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (Current Edition)
Suitable suppression systems should be installed in units in order to prevent or limit propagation between modules.	The specific suppression system will depend on a number of factors but will incorporate the most advanced fire suppression systems and meet UK 9540A and NFPA 855 standards.NFPA 855 (2023) confirms that water is the most effective battery fire suppression agent, therefore 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 Kent FRS. The suppression system must be capable to operate effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks. Any BESS fire suppression system will conform to NFPA 855 (2023) guidelines, and the suppression system will be tested to UL 9540A latest standard or significant third party fire and explosion testing. If the BESS system is designed to safely burn out to remove the risk of stranded energy in the battery systems, then full scale free burn / destruction testing will have been conducted to demonstrate that loss will be safely limited to one container without the intervention of Kent FRS.
An effective and appropriate method of early detection of a fault within the batteries should be in place, with immediate disconnection of the affected battery/batteries.	In the case of an incident, the inverter within the affected BESS compound can be immediately isolated from the remainder of the solar farm.Monitoring systems, independent of BESS control systems, will help identify any abnormal

NFCC Guidance	Project Commitment
	operation and automatically safely shutdown the system before it develops. Other measures include: a. Thermal monitoring of the battery containers and automated cut-out beyond safe parameters b. Battery cooling systems with automated fail-safe operation c. Emergency Stop – both remote and local.
Consideration should be given, within the site design, to the management of water run-off	Each BESS compound will be located within a bunded area lined with a protective membrane to limit any environmental impact of pollutants as a result of water run-off.

3 Consultation

3.1 Kent FRS – Consultation to Date

3.1.1 The Applicant consulted Kent FRS on its proposals for this Project as part of its statutory consultation and received responses on 28 November 2022 and 26 June 2023.

Table 3.1: Kent FRS 28 November 2022 Responses

Topic	Kent FRS Response
Access	Requirement for access in event of a fire, with 3.7m wide and 3.7m high clear passageway needed to enable fire appliance access.
Water Run-off	Water run-off should be considered to limit the environmental impacts of toxins associated with battery/switchgear incidents. Please provide guidance on how this will be achieved.
Electrical isolation	Requirement to isolate in event of fire incident to ensure risks to operational crews are minimised.
Battery technology	Request for early consultation on technology proposed to better inform operational responses.
Battery technology	Request for detail of active and passive fire precautions to reduce risk of uncontrolled fire spread.

3.1.2 Kent FRS provided a further response in June 2023 that requested additional information to demonstrate that the Project complied with the NFCC Guidance.

3.1.3 The Applicant provided further details on Project design and approach to fire risk mitigation to Kent FRS on 24 November 2023, including confirmation that the Project would commit to the commitments summarised in **Section 2.6** of this Outline BSMP to ensure compliance with the NFCC Guidance.

3.1.4 Kent FRS confirmed by email on 19 December 2023 that it had no objection to the proposal provided that NFCC Guidance is followed in the design and management of the Project.

3.2 Kent FRS – Future Engagement

3.2.1 The Applicant is committed to further engagement with Kent FRS as part of the final design process.

3.2.2 The **Draft DCO (Doc Ref. 3.1)** includes a Requirement that secures the submission of a BSMP to be approved by the local planning authority in consultation with Kent FRS and the Environment Agency, prior to the commencement of construction.

3.3 Other Consultees

3.3.1 The Environment Agency and Kent County Council (as Lead Local Flood Authority) have been consulted and both parties have confirmed the proposals, including the measures included in the **Outline Operational Surface Water Drainage Strategy (Doc Ref. 7.14(C))** [REP4-013], are satisfactory.

~~3.3.1~~3.3.2 Some members of the public have raised concerns regarding the potential for fire risk. The BSMP will ensure that the BESS installation complies with NFCC Guidance which fully mitigate the concerns raised in these consultation responses.

4 BESS Safety Requirements

4.1 Procurement

4.1.1 The Applicant's development team have been active in developing and constructing electricity generation projects for over ten years. The Applicant is therefore experienced in conducting tenders to procure electricity infrastructure and understands the requirement to ensure Tier 1, bankable, suppliers are identified.

4.1.2 The Applicant will select battery chemistry and a manufacturer that can ensure product reputation and meets ISO 9001 and ISO 14001 standards. ~~BESS Units will incorporate advanced fire suppression systems that meet UL 9450A and NFPA 855 standards, in addition to applicable national and local legislation in effect at the time.~~The BESS will be designed to address prevailing industry standards and good practice at the time of detailed 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).

4.1.3 A BESS fire suppression system, if integrated by the BESS Original Equipment Manufacturer (OEM), will conform to NFPA 855 guidelines, and the suppression system should be tested to UL 9540A latest standard or significant scale third party fire and explosion testing.

4.2 Project Design

Location

4.2.1 A key feature of the design is that the BESS Units are not located in one location but are instead distributed across the 192ha Site, typically in groups of four with a maximum grouping of eight BESS Units in any one area. This significantly reduces the risk of a fire incident involving multiple BESS Units.

4.2.2 The BESS electrical design, being DC coupled, means the BESS Units are located as part of the Inverter Stations. The Inverter Stations have been selected to minimise any environmental impacts to the extent possible, typically being located within field areas away from receptors to ensure any noise or other impacts are mitigated. As such similar BESS Unit impacts are also mitigated.

4.2.3 As a further consideration the nearest residential receptor to any BESS Compound will be ~~150m, circa six times the NFCC guidance recommendation.~~200m. BESS Units have not been included in fields where this distance cannot be achieved.

4.2.4 In accordance with NFCC draft guidance (2024) the detailed BSMP will include a site plan that shows all sensitive receptors within a 1 km radius of the Order limits that could be affected by a fire. The plan will have a compass rose showing north and the prevailing wind direction.

System Layout

4.2.44.2.5 The layout of the system will be designed to provide separation between key components or groups of key components as follows:

- The BESS will not be located in a single location. Instead, BESS will be located, typically in groups of four with a maximum grouping of eight BESS Units in any one area, as part of the Inverter Stations. The BESS infrastructure includes BESS Units and DC-DC converters.
- The separation distance between BESS Units will be a minimum of 6m. This separation distance will limit any fire that is not able to be contained to the effected BESS container or part of the battery system and will also allow access in case of an intervention being needed.
- The separation distance between the BESS Units and the outer boundary of the Order limits will be at least 10m which exceeds30m, in line with the current NFPANFCC draft guidance of 3m.(2024).

Battery Enclosures

4.2.54.2.6 BESS Units will house the energy storagebattery systems, electrochemical components and associated equipment.

4.2.6 In the event of a thermal event or fire, the enclosure will electrically isolate itselfThe BESS Units will be installed by a certified and is designed to contain any fire inside and prevent propagation to other BESS Units.

4.2.7 qualified installer. The BESS Units will be designedUL 9540 and constructed by/ or BS EN IEC 62933-5-2 certificated.

4.2.8 BESS Unit gas exhaust vents and deflagration panels must direct flaming or toxic gases away from site personnel or first responders in line with NFPA 68 and BS EN 14797, doors cannot be used as sole deflagration vents. The ventilation system should be provided with suitable ember protection to prevent embers from penetrating BESS enclosures (HVAC, gas exhaust, deflagration panels).

4.2.9 IEC Factory Acceptance Testing (FAT) or an independent manufacturing audit will be carried out to ensure the manufacturer in accordancesupplied BESS enclosures comply with the good practice availablerequisite certified ingress protection levels. Ingress Protection (IP) ratings of BESS enclosures will be shared with Kent FRS at the time, currently as outlined indetailed design stage so that risks associated with boundary cooling can be understood and implemented into the ERP. Potential boundary cooling water ingress points such as Heating, Ventilation and Air Cooling (HVAC) systems and deflagration vents will be considered as part of an incident response strategy.

4.2.10 The BESS enclosures will be locked to prevent unauthorised access and, will have an internal fire resistance rating of at least one hour (according to NFPA 855-, BR 187 and FM Global Datasheet 5-33).

4.2.11 Where required, BESS enclosure walls will have a minimum one-hour fire resistance rating to BS EN 13501-2 and BS EN 1364-1 standards.

~~4.2.7~~

4.3 Construction

4.3.1 The BESS construction will comply with UK legislation and good industry practice procedures. 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.

4.3.2 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.

BESS Transportation

~~4.3.2~~4.3.3 Transportation of the system from the factory to the Project Site will be a combination of sea and land freight. The equipment will be certified for transport to UN 38.3. Transportation[~~19~~11] and will be managed in accordance with the European Agreement Concerning the International Carriage of Dangerous Goods by Road ('ADR') 2019[20] and the UK guidance on the transport of dangerous goods "Moving dangerous goods, Guidance" webpage.

~~4.3.3~~4.3.4 The BESS will have undergone factory acceptance testing~~. As this will be undertaken away from Site this reduces the risks during on Site construction with visual inspections and functional testing undertaken before any site acceptance testing~~ (FAT) to IEC 62933-5-2 standards. Site Acceptance Tests (SAT) will follow IEC 62933-5-2 and IEEE 2962 (in development) standards and protocols.

Installation

~~4.3.4~~4.3.5 Installation will be supervised by the original equipment manufacturer and implemented in a hierarchical way to ensure that all necessary systems are available before the next step is required. This is expected to be in line with the following sequence:

- Inspect the items in the protective covers.
- Unpack and inspect the items.
- Install on the foundations.
- Once stable inspect the internal components.
- Mechanically anchor the unit to the foundations.
- Connect any dry riser pipes and or the fire suppression system & strobe and

siren.

- Install the electrical earthing/grounding.
- Electrically interconnect the equipment.
- Cold commission the equipment.
- Hot commission the equipment.
- Test the equipment.

Firewater Provision

4.3.54.3.6 Prior to delivery of the BESS Units the on-Site firewater provision shall be installed and operational. Regular inspections and testing shall be undertaken to ensure the systems remains functional and undamaged. If the on-Site firewater is not available for whatever reason BESS operations will be suspended until provision is made.

4.3.7 Water storage tanks will be located at least 10 m away from any BESS enclosure. They must be clearly marked with appropriate signage. They will be easily accessible to Kent FRS vehicles, and their siting should be considered as part of a risk assessed approach that considers potential fire development/impacts.

4.3.8 Water access points, whether hydrants or tank connections, will be located in consultation with Kent FRS to provide redundancy and safe operating distances for firefighters.

4.4 Operations

Operational Responsibilities

4.4.1 Prior to commercial operation an operational team will be appointed to manage, service, maintain and operate the BESS. The team will consist of key Applicant members and specialist sub-contractors and will have primary responsibility for ensuring the BSMP procedures are complied with.

Battery Management System

4.4.2 A Battery Management System ('BMS') will be used to monitor key electrical, mechanical and environmental parameters to ensure the system operates within its design thresholds. The BMS controls all aspects of the battery system and provides early warning, fault notification and disconnection of a BESS Unit in advance of an operational parameter being exceeded. These control systems would be failsafe by design with automatic shutdown of parts, or of the whole system, depending on circumstance.

4.4.3 Key parameters considered important for fire safety and monitored by the BMS are likely to include:

- Overall system voltage;
- System State of Health;

- System State of Charge;
- Single cell temperatures and differences;
- Single cell voltage and differences; and
- Enclosure ambient temperature.

4.4.4 In the event that a parameter is exceeded the BMS will be able to effect immediate disconnection of the impacted element from the electricity supply. Operational teams will then be able to investigate and provide reactive maintenance as required.

4.4.3 The BMS monitors a significant range and depth of data, and data analytics will be employed to exploit this information to should, at a minimum, incorporate NFPA 855 (2023) monitoring and control features and conform to the new IEEE 2686 (February 2025) standard: Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications. Additional IEEE standards in development should be adopted by the BESS system provider once published.

4.4.54.4.4 If data analytics are not directly integrated the Applicant will ensure a Data Analytics package is integrated to provide a greater range of performance and safety data i.e. predict ageing of the cells in the BESS andbattery systems, alert BMS faults or malfunctions, identify electrical abuse during operations, alert the operator when modules need maintenance or replacing.decommissioning. Data analytics will alsoAnalytics facilitate more accurate determination of State-of-Charge ('SoC') and hence State-of-Health ('SoH'). assessment of operating temperature variations, voltage anomalies, State of Charge (SOC), and State of Health (SOH). Data Analytics can also monitor complimentary BESS safety features i.e. smoke and gas sensors, BESS multi-sensor equipment, ground fault detectors, etc.

4.4.6 Data Analytics will automatically detect anomalous changes in temperature, cell resistance and capacity at rack level (which could indicate lithium metal plating, corrosion, failure of components and cables) and can monitor an essentially unlimited number of sensors including smoke & gas sensors.

4.4.5 Other measures which The BMS will meet the minimum safety functions included in NFPA 855 (2023) with a commitment to update to NFPA 855 (2026) revisions when available.

4.4.6 Battery cell certified to UL 1973 and/or BS EN 62619 and tested to UL 9540A unit or installation level for BESS designs.

4.4.7 Module design will be certified to UL 1973 and/or BS EN 62619 and tested to UL 9540A unit or installation level.

4.4.74.4.8 Safety Certifications and mitigation features typically found within battery module design that may be incorporated into the BESS design include:

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

cabinet design likely to be employed has very limited free volume rendering Heating, Ventilation and Air Cooling ('HVAC') systems relatively ineffective.

- Fire and vapour cloud (immediate and delayed ignition) detection.
- Electrical fire suppression equipment such as NOVEC 1230, StatX powder fire suppression, or other contemporary system.

a. Internal fuses;

b. Liquid cooling system;

c. Active thermal management system (TMS);

d. Contactor at rack/string and bank level;

e. Overcharge safety device;

f. Internal passive protection products;

g. Venting systems and gas channels;

h. Thermal or multi-sensor monitoring devices

Monitoring

4.4.84.4.9 24/7 monitoring will be provided via a remote-control room with staff fully trained and familiar with BESS system technology. The control room will be responsible for the following:

- Alerting Kent FRS and, being the first point of contact with Kent FRS. and for connecting Kent FRS with BESS incident Subject Matter Experts (SMEs).
- The security of the Site with access to the detection and monitoring systems. The monitoring and detection systems can be used in an emergency to support first responders.
- Be able to immediately shut down the system should the need arise.
- Be responsible for the implementation of the emergency plan acting as a point of contact to emergency services.
- If possible, internal BESS monitoring data should be accessible to the fire service with access to information (e.g., temperature and gases) provided digitally for first responders.

4.4.9 The BESS compound will have signage in accordance with NFCC Guidance, identifying the dangers within the Site and will also have the control room emergency telephone number should a member of the public or emergency services need to make contact.

Fire and Explosion Detection and Suppression

4.4.10 The overall fire mitigation strategy is a combination of fire detection (including real time monitoring via a BMS), within BESS Unit suppression and, where required, external suppression of a fire and cooling of the affected unit.

4.4.11 Battery fires can start for a number of reasons including physical damage, overcharging, over discharging, short circuiting and exposure to high temperatures. Battery failure causes an increase in internal temperatures created by heating and/or chemical processes within cells which results in the release of gas. This outcome is known as thermal runaway and can impact adjacent cells.

4.4.124.4.10 The BESS Units will have in- built detectionmonitoring systems that will immediately shut down the batteries help identify any abnormal operation and automatically safely shutdown the system before it develops in the event that abnormal conditions are identified. In the event this does occur before gas build-up the BESS Units also contain a deflagration system that will vent the combustion gasses and pressures from within the container to reduce the risk of a build-up within the BESS Unit. These systems will be independent of the control systems and equipment that can cause the abnormal event and avoid the use of Safety Integrity Level (SIL) rated risk controls.

4.4.13 The BESS Units will also include an automatic fire suppression system. This is likely to be a water sprinkler or gaseous based system which will cool the cells to stop thermal runaway as well as extinguish any fire that may ignite as a result.

a. Thermal monitoring of the battery containers and automated cut-out beyond safe parameters

b. Battery cooling systems with automated fail-safe operation

c. Emergency Stop – both remote and local.

4.4.11 The fire, gas detection and ventilation system for the Scheme will comply with NFPA 855 (2023) and NFPA 69. This means that smoke, fire and gas detection equipment will be installed on site. The gas detection systems should have external BESS beacon and audible alert facility. The final fire detection design will be validated by an independent Fire Protection Engineer under the responsibility of the OEM Contractor prior to construction, and will be approved by Kent FRS.

4.4.12 The ventilation and gas extraction system shall also be designed to exhaust flames and gases safely outside the BESS enclosure, without compromising the safety of first responders. An NFPA 69 compliance report should be provided to demonstrate the compliance of the gas exhaust system with NFPA 855 explosion prevention system requirements.

4.4.13 Heating and cooling of the battery modules will be provided by an independent liquid cooling system which is separate to any HVAC system providing climate control for the BESS enclosure. When mechanical ventilation is required to maintain concentrations below the required limits, it shall be interlocked, so that the system shuts down upon failure of the ventilation system.

4.4.14 NFCC 2024 draft guidance acknowledges that it is increasingly common for BESS enclosures to be designed without integrated automatic fire suppression systems. If the BESS system is designed to safely burn out without internal fire suppression

systems, UL 9540A heat flux test data (if full propagation of battery system occurs) will establish safe distances between containers and ESS equipment and additional 3rd Party fire and explosion testing will be required to also demonstrate that structural integrity is maintained and toxic gas emissions to the closest receptors are below PHE guidelines. In addition full scale free burn / destruction testing will have been conducted to demonstrate that loss will be safely limited to one enclosure without the intervention of Kent FRS. An independent Fire Protection Engineer specialising in BESS will review all UL 9540A test results and any additional 3rd Party fire and explosion test data which has been provided.

4.4.15 The BESS unit locations will be connected to fire water tanks via a (pump driven) pressure fed hydrant network to potentially control a fire, should one break out in the BESS area. Site and BESS design principles and ERP content will ensure that Kent FRS are expected to employ a defensive strategy i.e. only boundary cooling should be employed for cooling of adjacent BESS Enclosures or ancillary equipment, this ensures that environmental pollution risks are minimised. Boundary cooling typically involves firefighters directing water fog or spray pattern discharge to ensure the incident does not spread to adjacent BESS enclosures. NFCC revised guidance states: "*If it can be confirmed that the recommended firefighting tactic for the BESS is to defensively fire fight and boundary cool whilst allowing the BESS to consume itself, this will reduce the water requirements, and thus the drainage / environmental protection requirements significantly.*"

4.4.16 BESS design and site layout should minimise the requirement for direct FRS intervention, i.e. the use of direct hose streams or spray on BESS. FRS intervention in worst case scenarios would ideally be limited to boundary cooling of adjacent BESS Units and ancillary infrastructure to prevent the fire from spreading. This strategy would be finalised with Kent FRS and clearly communicated in the ERP, secured by this document.

~~4.4.14~~4.4.17 In the event that external fire suppression is required then a fire hydrant network will be available at each BESS Unit location that will be capable of providing minimum firewater volumes in line with NFCC ~~guidelines. It is generally recognised that, in a container and rack-based BESS, water mist or sprinkler systems can extinguish LFP fires and protect adjacent racks (depending upon spacing).~~Guidance of 1,900 litres per minute for two hours.

4.4.18 A post-incident recovery plan shall be developed that addresses the potential for reignition of BESS, as well as removal and disposal of damaged equipment. A fire watch should be present until all potentially damaged BESS equipment containing Li-ion batteries is removed from the area following a fire event. The water supply should be replenished as quickly as feasible. Fires involving Li-ion batteries are known to reignite. Li-ion batteries involved in or exposed to fires should be adequately cooled to prevent reignition.

Firewater Runoff

~~4.4.15~~4.4.19 The BESS Unit locations ~~are~~will be designed to ensure any firewater ~~required~~within the BESS area is contained such that there will be no leakage of polluted water into the surrounding area following a fire event.

4.4.164.4.20 Firewater collected and retained would be pumped to tanker and removed from Site for treatment and disposal at a suitable licenced facility. Following a fire event, the drainage network will require an assessment to confirm the absence of any contaminants prior to the penstock being released.

Security

4.4.174.4.21 The BESS will be located within a fenced enclosure with, signage that clearly identifiesshould be installed in a suitable and visible location on the dangers withinoutside of the SiteBESS Enclosures, identifying the presence of a BESS system. Signage would be as per NFCC guidelines and will also have the control room emergency telephone number.include details of:

a. Relevant hazards posed i.e., the presence of High Voltage DC Electrical Systems is a risk, therefore their location should be identified.

b. The type of technology associated with the BESS.

c. Any suppression system fitted.

d. 24/7 Emergency Contact Information.

4.4.22 Signs on the exterior of a BESS Enclosure will be sized such that at least one sign is legible at night at a distance of 30m or from the site boundary, whichever is closer.

4.4.184.4.23 The Site will also have high quality CCTV/thermal imaging cameras to identify unauthorised access and to enable the correct security response to be undertaken by the control room.

4.4.24 Each BESS Unit area will have two points of ingress / egress for first responders and details of site access arrangements such as key codes, which will be provided to Kent FRS.

Cybersecurity

4.4.194.4.25 Given the Project is classified as a National Significant Infrastructure Project and the effects people can have on the control systems if they gain access, cybersecurity will be a fundamental requirement of the system design.

4.4.20 The cybersecurity will be designed making reference to the following:

- IEC 62443 control systems cybersecurityCybersecurity will form a fundamental part of the system design and architecture as there is an increasing focus in this area from national and international regulatory bodies. International standards[21];
- Guidance from the such as IEC 62443, UL 1741, UL 2941 (2023), IEEE 1815, and IEEE 1547.3 will be consulted and guidance from national sources such as National Cybersecurity Centre; and
- inform the implementation and protection measures. Reference should be

made to the Health and Safety Executive (HSE Operational Guidance document OG86[22].

Maintenance

4.4.214.4.26 The BESS will be maintained and operated by skilled personnel ensuring that the system is in optimal condition and that all parts of the system are fully serviced and functional at all times.

4.4.224.4.27 As well as maintenance triggered by the BMS, routine maintenance will be undertaken on the BESS equipment to includeevery 6-12 months (dependent on risk profile) in addition to periodic visual inspections, checking connections, and rectification of any defects.

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

Battery Replacement

4.4.244.4.29 During the operational phase of the Project, there may be a requirement to replace the battery system modules due to equipment failure or degradation of the system capacity. The planned design life may require replacement of the battery systems on more than one occasion depending on use case.

4.4.254.4.30 The risks associated with any wholesale replacement with similar or any new technological developments will also be considered before any works commence. It is also possible that any replacement of the system may use an updated version of the of the original BESS system module.

4.5 Decommissioning

4.5.1 During decommissioning of the Project, the same on-Site protocols and procedures employed during the construction stage will be used.

4.5.2 The Applicant will follow the hierarchy of waste management throughout the life of the Project as follows:

- Reduce – lithium-ion batteries have a finite life based on a number of factors, primarily the total number of cycles undertaken. The operation will attempt to manage the degradation by the selection of services and cycling that maximises the overall life.
- Recycle – The supplying manufacturer will have obligations under the Waste Batteries and Accumulators Regulations 2009[23] (as amended) (or such equivalent regulations in force at the time of decommissioning) and will be contractually obliged to offer a recycling service.
- Recovery – The recycling should allow any useful materials to be recovered

and re-enter the supply chain.

- Disposal – Any disposal of batteries shall be undertaken in compliance with all applicable Laws and all regulatory requirements, product stewardship, registration disposal and recycling or take back requirement.

5 Firefighting

5.1 Fire Service Guidance

5.1.1 Fire Service Volume 2 (Fire Service Operations)[24] provides guidance for the Fire Service regarding electrical installations including power plants, such as this Project, and supporting electrical infrastructure. The guidance states that in the instance of a fire, upon the Fire Services arrival to the site, the Fire Service should ensure all electrical equipment has been electrically isolated and made safe to approach, by the site operator. The guidance strongly advises that any electrical equipment should not be approached, or touched unless it is confirmed to be isolated and safe.

5.1.2 The NFCC Guidance also provides details and requires that site operators develop emergency plans and share these with the Fire and Rescue Service. Emergency plans will be developed and agreed with Kent FRS prior to installation of the BESS. Specific details on commitments are provided in Table 2.1.

5.1.3 The BESS will be housed in containers in various locations across the Site and be sufficiently separated to minimise the chance of fire spreading, based on the best practice which is currently NFPA 855.

5.1.4 If an incident occurs the ~~container~~battery system and associated electrical infrastructure will be automatically electrically isolated. However, the operator and Fire Service will be unable to confirm the state of charge of the batteries and the potential residual risk from any energised batteries within the container.

5.1.5 As outlined in **Section 3** of this Outline BSMP, Kent FRS have been consulted and the Applicant will continue to engage with Kent FRS through the development of the system design, construction, operation and decommissioning of this Project. It is expected that Kent FRS will implement a defensive strategy in the event of a fire involving the BESS which should ~~include 'fogging out' any gasses or fumes from the batteries~~be limited to containment and boundary cooling of adjacent BESS Units to prevent the fire from spreading. This strategy would be finalised with Kent FRS and clearly communicated in the ERP, secured by this document.

5.2 Kent FRS Access

5.2.1 The **Illustrative Project Drawings – Not for Approval (Doc Ref. 2.6)** indicate (for illustrative purposes only) the fire access route designations (permanent access tracks for operations) and entry points/gates Kent FRS could use in the event of a fire. The plan also shows the indicative locations of the BESS Units. A version of this plan was provided to Kent FRS in November 2023.

5.2.2 The access plan has been designed to allow easy access to the Site ~~and~~. Final design of the Site will comply with the following:

- All Site roads will be clearly labelled.

- Access roads to all BESS enclosures will be accessible from two directions, thus there will be no dead-end access routes and no allowance for turning vehicles will be required.
- All access roads will be at least 3.7m wide and will employ a grass-paving approach which has been used elsewhere in the UK for fire service access. This road composition has a load carrying capability in compliance with Building Regulations and the NFCC Guidance.
- Multiple access routes will be available into the site from public highways.

5.2.3 Site ~~personnel will not have access into any battery enclosures therefore there is unlikely~~plans that conform to ~~be an immediate threat~~the requirements in the NFCC Draft Guidance (2024) will be provided to ~~life from inside the BESS units.~~Kent FRS.

5.3 Emergency Response Plan

5.3.1 ~~As part of the development of the BESS, an~~A robust and validated Emergency Response Plan ('ERP') will be produced, in consultation with Kent FRS~~. The emergency plan~~, that will conform to NFCC Guidance.

5.3.2 This will include as a minimum:

~~5.3.1~~ How the ~~following information which~~FRS will be ~~open and freely available to first responders~~alerted and ~~the local authority:~~

- ~~**Full system**~~incident communications and ~~**Site**~~monitoring capabilities.
- Facility description~~: Layouts indicating location of all BESS units,~~, including infrastructure details, operations, number of personnel and operating hours.
- A site plan depicting key infrastructure: site access points and internal roads, agreed access routes ~~and evacuation routes, emergency information such as chain of command and site operating procedures~~, observation points, firefighting facilities (water tanks, pumps, booster systems, fire hydrants, fire hose reels etc), drainage and water capture details.
  - ~~**Design drawings and schematics:** BESS schematics and wider site schematics for reference.~~
  - ~~**Electrical isolation procedures:** Including locations of points of isolation for each BESS and procedures for isolating equipment in the event of a failure.~~
  - ~~**BESS information:** Number of cells in each container, cell chemistry, COSHH Assessment (Control of Substances Hazardous to Health Assessment), Material Safety Data Sheets and fire detection and suppression systems in each container as well as system operation guidance.~~
  - ~~**Firefighting strategy:** Firewater provisions, additional firefighting equipment, information regarding firefighting systems, site specific fire risk and mitigation.~~
  - ~~**Medical procedures:** Chain of command for medical emergencies, medical~~

emergency protocol, location of emergency medical supplies and information regarding on-Site first aiders.

- **Operation and maintenance procedures:** Documentation of operations and maintenance procedures, timelines including duration and type of work.
- **Decommissioning procedures:** This should include information regarding the decommissioning and removal of damaged cells and additional electrical equipment.
- **Safety and emergency response drills:** Procedures and schedules for conducting emergency and safety response drills (e.g. fire drills, medical drills and fire detection system testing).

- **Site specific**Up-to-date details of the emergency response co-ordinator including the subject matter expert for the site.
- 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: Specific risks for at the BESS units and subsequent electrical equipmentfacility and details of their proposed management.
- The role of the FRS at incidents involving a fire, thermal event or fire spreading to the site.
- 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.

Emergency Response Team

5.3.25.3.3 An emergency response team should be identified in the emergency response plan for the construction, operation and decommissioning phases of this Project.

5.3.35.3.4 The construction emergency response team ('CERT') should comprise of senior members from the following organisations:

- Kent FRS;

- Principal Designer;
- Principal Contractor; and
- Elected Contractors and Sub-contractors.

5.3.45.3.5 The CERT will be responsible for developing the emergency response plan as well as, liaising with and providing updates to local emergency services, hosting regular meetings and reviews of the plan, test and evaluate the emergency response plan and ensure the BSMP is followed.

5.3.55.3.6 The operational emergency response team ('OERT') should comprise of senior members from the following organisations:

- Kent FRS; and
- Operation and Maintenance Contractor.

5.3.65.3.7 The CERT will be responsible for liaising with the OERT, prior to the Site becoming operational and handing over the emergency response plan during the construction phase. The OERT should also review and update the emergency response plan to reflect the operations on Site as well as liaising with local emergency services to share the updated plan, ensuring a smooth transition between the construction and operational emergency response plan. Similarly, to the CERT, the OERT should also maintain and update the emergency plan regularly, updating all stakeholders on changes, host regular meetings and reviews of the plan whilst testing the plan through scenario-based evaluations and ensure all BSMP protocols and guidelines are followed.

5.3.75.3.8 The OERT will also be responsible for updating the emergency response plan to reflect any changes required in the decommissioning phase of this project.

Post-Incident Response

5.3.85.3.9 In the unlikely event of an incident on-Site, the Applicant or the Site operator will engage with the local community and will establish an executive stakeholder steering group within 24 hours of the incident. The group should include parties involved in the emergency response.

5.3.95.3.10 If an incident occurs, an action plan will be produced, highlighting any immediate and long-term actions.

6 Pre-Construction Information Requirements

6.1.1 The battery system mitigation measures adopted in a final BSMP, will reflect the latest BESS safety codes and standards applicable at that stage. Mitigation measures will be discussed and coordinated with Kent FRS.

6.1.2 Information will be provided to Kent FRS as early as possible in the detailed design ~~phase~~stage to allow an initial appraisal of ~~this Project will consider the whole lifecycle~~the BESS to be undertaken.

6.1.3 Some example BESS and site design information which is anticipated to be shared with Kent FRS (KFRS) to establish a risk profile for first responders, are listed below:

- Battery chemistry integrated into BESS – can provide fire and explosive risk profile.
- Battery form factor (cylindrical, pouch, prismatic).
- Battery energy Wh/KWh – confirmation of ~~the BESS and~~ new vs second life cells.
- Battery module cooling system details (e.g. liquid cooling design, air cooling design) – cooling or thermal management system (TMS) capability assessment to stop or reduce battery cell thermal runaway propagation.
- Battery module vent or gas exhaust specifications.
- Battery module KWh energy + number of cells contained in the module + battery circuitry details (number of cells in series vs number of cells in parallel).
- Direct suppression system details – module or rack level integration.
- Rack design – number of modules and KWh energy, spacing between modules, passive protection features, gas exhaust features, electrical isolation functions, heat or thermal runaway sensor integration, etc.
- Rack configuration – spacing to adjacent racks, number of racks in BESS, spacing to walls, doors, gas vents and roof.
- Type of BESS design e.g. container or cabinet, gas exhaust/ventilation features, deflagration vent design features, BESS enclosure level fire protection and suppression system details (proof of testing with BESS design + test data), additional fire or explosion protection features i.e. thermal barriers.
- EMS / BMS data monitoring capabilities and incident response integration capacity.
- Number of BESS enclosures / number of BESS areas on site.
- Size and MWh capacity of each BESS enclosure.

- BESS and ESS equipment spacing; spacing to other equipment, boundaries, vegetation, roads or access routes, fire hydrants/water tanks, site building structures, etc.
- Access routes, observation points, turning areas, KFRS equipment and assets, water supply locations and capacity, drainage, and water capture design.
- Definition and frequency of BESS equipment testing and maintenance requirements.

6.1.4 Digital provision of safety information and procedures must be provided to site operatives, first responders and SMEs during BESS incident response - hard copy printed materials must be available onsite (location agreed with KFRS). As a minimum content will include~~, but not be limited to~~ :

a. Digital emergency response plans.

b. Remote emergency shutoff procedures.

c. SDS/Hazardous material documentation.

d. Maps or design drawings.

e. Gas detection capabilities; could include multi-sensor data metrics e.g. Carbon Dioxide (CO2), Carbon Monoxide (CO), Hydrogen (H2), VOC off gas and overpressure and local temperatures.

f. Fire protection system data e.g. temperature, alarming, suppression status, etc. – establish discharge warrantee clauses, emergency BESS venting procedures, discharge times, impact on ventilation and detection systems, etc.

g. ERP training drills for site operatives + KFRS engagement (site familiarisation + training drills) and SME engagement (fire protection experts or battery experts).

h. Other documentation as required by specific BESS project i.e. local response stipulations, contact information for nominated response personnel, community contacts, etc.

6.1.5 Risk assessment tools will be utilised together with detailed consequence modelling to provide a comprehensive site operations and emergency response safety audit.

~~6.1.1~~6.1.6 As stipulated in NFPA 855 (2023) the following ~~studies~~assessments will be considered:

- Failure Mode and Effects Analysis ('FMEA'). (BS EN IEC 60812) or Layer of Protection Analysis (LOPA) will be conducted to lay the foundation for predictive maintenance requirements and complement the fault indicator capabilities of the BMS data analytics system.
- Comprehensive Hazard Mitigation Analysis (HMA) will be conducted following

NFPA 855 (2013) guidelines and recommendations, to cover both BESS system and site-specific safety issues.

- Additional site-specific risk assessments that may be undertaken at detailed design include:
- Hazard and Operability Analysis ('HAZOP');
- Hazard Identification ('HAZID');
- Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) study
- Failure Mode and EffectsFire Risk Analysis ('FMEA').(FRA)
- Explosion Risk Analysis (ERA); and

6.1.26.1.7 A detailed BSMP will be produced in consultation with Kent FRS. This BSMP will be submitted to the local planning authority for approval prior to commencement of the BESS. and will include a plume analysis study of the BESS system selected at the detailed design stage. Toxic gas emissions to sensitive receptors must be below Public Health England (PHE) guidelines when the battery system of a BESS is fully consumed (burnt out).

6.1.3 The detailed BSMP must include the following:

- Detailed design (including drawings showing the location, arrangement and schematic of the BESS);
- BESS specification (including battery specification and chemistry and fire detection and suppression system);
- Operational procedure and training requirements (including emergency operating procedures);
- Statement of compliance to applicable legislation;
- Environmental Risk Assessment (including the potential for indirect risk and mitigation using the best available techniques for the specific battery chemistry); and
- An emergency plan covering construction, operation and decommissioning of the Project (should be developed in consultation with Kent FRS and include a firefighting strategy and firefighting equipment on Site).

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

7 Conclusion

7.1 Conclusion

7.1.1 The Applicant is committed to developing safe BESS that will ensure dependable operation over the long term, minimise any risks and ensure safe operation.

7.1.2 This report demonstrates that robust processes have been followed in approach to the BESS included within the Project and that the relevant stakeholders have been consulted and their responses have informed the design of the Project.

7.1.3 The Applicant is committed to ongoing dialogue with Kent FRS to ensure the final design complies with NFCC guidance. This Outline BSMP provides a list of pre-construction information requirements that will evidence prior to construction of the BESS that the Project will be implemented and operated safely.

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