The Greenspan Agency

Battery Health and Safety Statement

Battery Point Energy Storage Park

Site Address	Land north of HM Coastguard Station, Battery Point, Stornoway, HS1 2RT
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The Greenspan Agency	6 Castle Street, Edinburgh, EH2 3AT 0131 514 4444 https://greenspanenergy.com/

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Contents

1. Introduction

1.1. This report sets out battery energy storage system health and safety information to explain how risks have been mitigated. It has been provided as additional information in respect of planning application 24/00155/PPDM.

1.2. The discussion of risks in this report should not be read as confirmation that hazards will be present in the completed battery system. Rather, the discussion of risks at the planning and design stage is a sensible means of reducing risks which could materialise were measures to mitigate such risks not in place.

1.3. The applicant, Point and Sandwick Trust, is community owned and run and has been able to deliver transformative levels of investment into local projects in recent years, using revenue from its wind turbines. The trust's emerging new project, a battery scheme at Battery Point, aims to create another revenue-earning asset for the good of the community and help secure the island's energy system while also enabling all the island's community-owned wind farms to increase their overall output. The Point and Sandwick Trust are entirely committed to a safe and responsible project.

1.4. In recent years, battery technologies have advanced significantly to meet the increasing demand for portable electronics, electric vehicles (EVs) and battery energy storage systems (BESS). Most of us accept that our own battery powered mobile phones or laptops are very safe.

1.5. The following analysis summarises how risks have been, and will continue to be, mitigated for this project.

2. Battery Technology

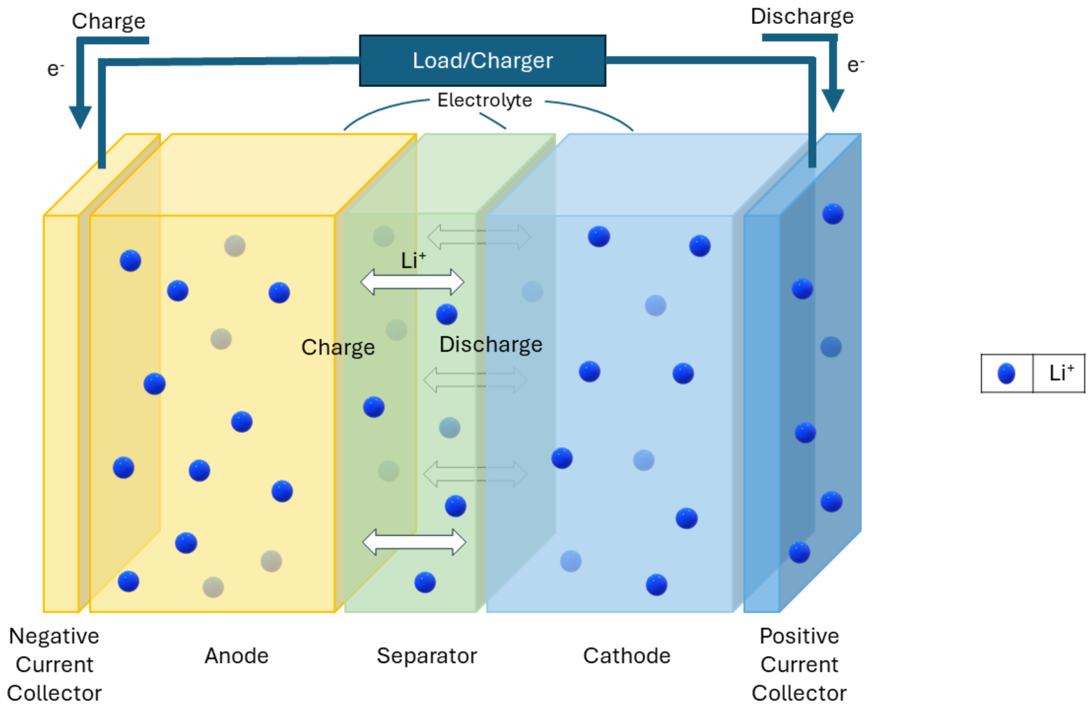
2.1. The most used battery technology for a wide range of applications is currently lithium-ion. These batteries are widespread in personal electronics, such as mobile phones and laptop computers but also in industries such as aerospace, all applications for which regard safety as being of paramount importance[1]. They are also used in electric vehicles and are the leading technology for grid connected battery energy storage systems of the type proposed in this planning application. The technology is mature in terms of its manufacture, standards, and safety in use. That is to say, the technology is not at the research and development nor demonstration stages. It is the developer's intention to use lithium-ion batteries in the proposed development, although other safe technologies such as lithium-sodium will also be considered when they become mainstream.

[1] https://skybrary.aero/articles/aircraft-batteries

Lithium-ion Batteries Technology in Battery Energy Storage Systems (BESS)

2.2. Lithium-ion batteries are the most common category of rechargeable batteries. The principle behind the lithium-ion battery is to circulate electrons by creating a difference in potential between two electrodes, one negative (an anode) and the other positive (cathode), that are immersed in a conductive ionic liquid called the electrolyte[2]. These components are all stored within a container, please see Figure 1. The chemical process by which energy is stored, involves lithium ions moving from the negative anode to the positive cathode during discharge and back when charging – this reversible reduction-oxidation reaction chemically stores electrical energy for use later. With BESS systems, when needed the electrochemical energy is discharged from the batteries to meet electrical demand to reduce any imbalance between energy demand and energy generation.

Figure 1. Lithium-ion Battery Diagram



2.3. There are different battery types which vary by ion types, electrode materials and associated electrolytes. Although both lithium ion and lead acid batteries use same technology to store and provide energy, the primary difference lies in the material used as cathode, anode, and electrolyte. In a lead-acid battery, lead is used as the anode, and lead oxide is used as a cathode. In a lithium-ion battery, carbon is used as the anode, and lithium oxide is used as the cathode. As can be seen, the lithium-ion batteries chosen for this application are a very different technology than acid-based batteries. The sulphuric acid in acid-based batteries is highly corrosive and so acid-based batteries must be designed to reduce the likelihood of

[2] How an electric car's lithium-ion battery works - Easy Electric Life - Renault Group

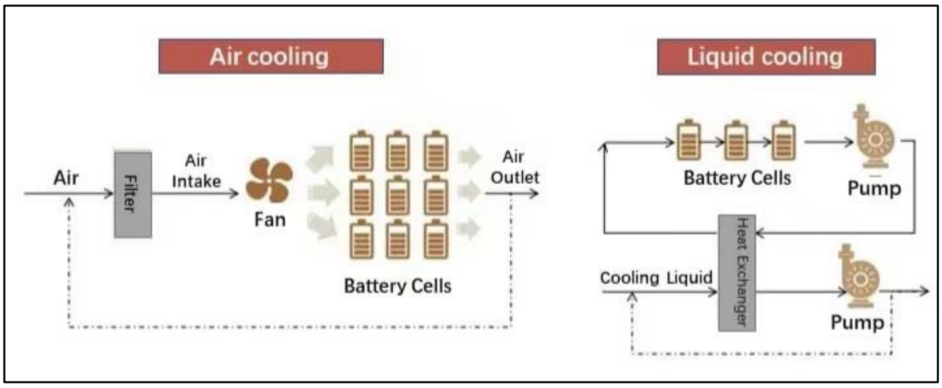
sulphuric acid leaks[3]. While certain chemistries of lithium-ion batteries can be prone to thermal runaway if not designed properly, advancements in technology have significantly improved safety.

2.4. Large grid connected BESS are developed in a modular fashion, where individual battery cells are combined to create modules, modules are combined within racks, and these can then be combined to make fully containerised battery systems (usually with in-built control, protection and safety functions). In this way, large scale grid battery systems are simply made of lots of smaller batteries not dissimilar to those used in electric vehicles. Grid scale applications consist of multiple containers, connected via multiple inverters, transformers and switchgear under a single point of connection to the electrical grid[4].

Cooling Systems

2.5. Batteries produce heat during normal operation and the dissipation of this heat must be considered at the design stage. A liquid-cooled system is proposed for Battery Point. Liquid cooling is a technique that involves circulating a coolant, usually a mixture of water and glycol, through a network of pipes which absorb and dissipate heat generated during the operation of the batteries. This contrasts with air-cooled systems, which rely on air moved by fans within an enclosure to cool the battery cells[5] (see Figure 2). Liquid-cooled systems are safer than air-cooled systems and the latter (such as used in the Liverpool BESS incident in 2020) is now considered to be a legacy design. Liquid cooling provides superior thermal management capabilities compared to air cooling. It enables precise control over the temperature of battery cells, ensuring that they operate within an optimal temperature range. This is crucial for maintaining the longevity and performance of the batteries. Liquid cooling also helps prevent hot spots and minimizes the risk of thermal runaway, a phenomenon that could lead to failure in battery cells. This is a crucial factor in environments where safety is paramount.

Figure 2. Air-cooled System vs Liquid Cooled System



[3] Lithium batteries vs Lead Acid batteries - SAFETY4SEA
[4] Health and safety in grid scale electrical energy storage systems (accessible webpage) - GOV.UK (www.gov.uk)
[5] Liquid Cooled Battery Energy Storage Systems - Symtech Solar January 28, 2024

Maturity of Lithium-ion Batteries and Risk Reduction

2.6. Battery powered devices are ubiquitous in modern life and we take it for granted that battery powered phones and laptops are safe for everyday use.

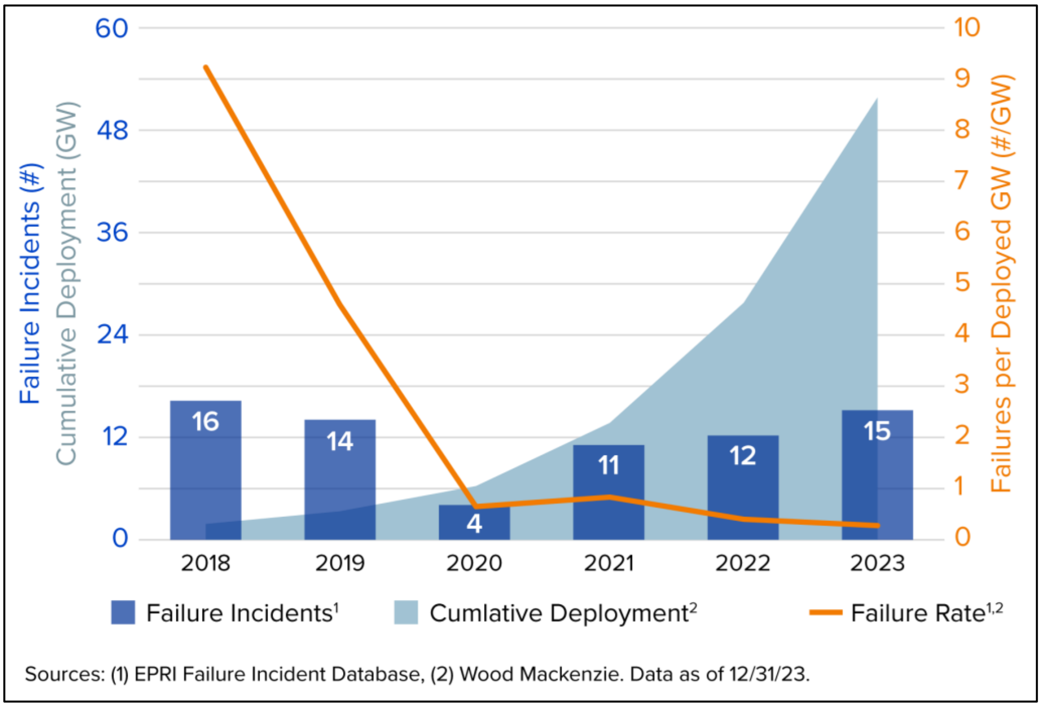
2.7. Although the technology is mature and established, the battery industry continues to engage in R&D activities to reduce residual risks[6].

Frequency of BESS Failures

International Trends

2.8. Research conducted by EPRI compares the number of failure incidents over time against deployment of BESS[7]. Figure 3 below shows that although the global installed capacity of utility-scale BESS has significantly increased over the last five years, the overall rate of incidents in terms of failures per deployed gigawatt of storage has sharply decreased as lessons learned from early failures have been incorporated into the latest designs.

Figure 3. Global Grid-Scale BESS Deployment and Failure Statistics, Source EPRI.



UK Trends

2.9. There has been a similarly large rate of growth for BESS in the UK. While there is no definitive database, two sources are relevant and have been reported in: 'Research Briefing, Battery Energy Storage Systems (BESS)', House of Commons Library, published 24 April 2024:

[6] See also Section 4 below.

[7] BESS Failure Incident Database - EPRI Storage Wiki

- *"RenewableUK, a trade association for wind, wave and tidal power industries in the UK, estimated that, in December 2023, the total capacity of operational battery storage sites in the UK was 3.5 GW. RenewableUK further estimated that the capacity of projects under construction was 3.8 GW and the capacity of projects that had been granted consent but not yet constructed was 24.5 GW in December 2023"* – page 11
- The UK Government's renewable energy planning database recorded that *"as of January 2024, there were 105 operational BESS in the UK, with a total capacity of at least 2 GW"* – page 12.

2.10. The Battery Point project will be 25 MW in capacity. A GW is 1000 MW. So, taking the lower estimate above of 2 GW, there are 2000 MW operational in the UK, with only 1 documented failure (the Liverpool incident which is detailed in Section 4 below).

3. Battery Safety Measures

3.1. In the context of this project, any risks relating to battery storage can be mitigated in four key ways:

- Battery System Design – Design within the individual battery units and systems.
- Site Design and Location – Larger scale design and planning considerations.
- Construction Risk Mitigation
- Ongoing Measures

3.2. These four safeguarding approaches are expanded upon below.

Battery System Design

3.3. Battery systems are designed in accordance with relevant internationally recognised safety standards to minimise risks and ensure quality. Standards such as these keep billions of individual users of battery powered devices safe worldwide.

3.4. Standards are constantly improved and amended.

Procurement

3.5. At the time of writing the final battery equipment to be used for the project has not been selected. This will be confirmed through a commercial tender process at a later date. Candidate battery systems considered for the site use Lithium Iron Phosphate (LFP) chemistry modules[8] rather than Lithium Nickel Manganese Cobalt (NMC). Guidance provided by the UK Government states that the LFP chemistry is preferred from a safety perspective because it has a higher thermal runaway temperature threshold compared to NMC[9]. The maturity of LFP technology is evidenced in the fact that BYD, one of the biggest electric vehicle manufacturers, uses LFP for their EV batteries.

[8] Budgetary proposal Jan 2022.
[9] Health and safety in grid scale electrical energy storage systems (accessible webpage) - GOV.UK (www.gov.uk) paragraph 3.2.1.1

3.6. The client is committed to the procurement of high-quality equipment, both for reasons of safety but also because such equipment is longer lasting, easier to insure, and a more resilient commercial proposition. When procurement decisions are made battery safety will be a key consideration in the review of tenders provided by battery technology providers.

Standards

3.7. Relevant standards are constantly being reviewed and improved by standards organisations such as the International Electrotechnical Commission (IEC). While the exact standards applied to the design of a given system depend on the use of the battery, region, and exact equipment, some examples are listed below:

- UN38.3 - 'Lithium Metal, Lithium Ion and Sodium Ion Batteries'[10]
- UL 1973 - Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications[11]
- UL 9540 - Energy Storage System (ESS) Requirements
- UL 9540A - Test Method[12]
- IEC 62619 - 'Safety requirements for secondary lithium cells and batteries, for use in industrial applications'[13]
- IEC TC 21 - Secondary cells and batteries
- IEC TC 120 - Electrical Energy Storage (EES) systems
- IEC 61000-6-2 - Immunity standard for industrial environments[14]
- IEC 61629-1 - Aramid pressboard for electrical purposes
- IEC 62477-1 - Safety requirements for power electronic converter systems and equipment[15]

3.8. Candidate equipment being considered for Battery Point will adhere to all the relevant standards above.

3.9. Additionally, BSI, the UK's national standards body, has a committee dedicated to the safety of electrical energy storage systems, ESL/120.16

[10] Page 426, United Nations, Manual of Tests and Criteria accessible here: https://unece.org/transport/standards/transport/dangerous-goods/un-manual-tests-and-criteria-rev8-2023 and referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[11] Referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[12] Referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[13] Referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[14] Referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[15] Referred to in CATL document '280Ah_2h Outdoor Liquid Cooling Rack'.
[16] BSI, 'ESL/120 - Electrical Energy Storage'. Accessible here.

Design Features for Enhanced Safety

3.10. Other system design features of the proposed development reduce the risks of the grid-scale energy storage installation:

- **Battery Monitoring:** Modern, grid-scale battery units are fitted with sophisticated monitoring systems, allowing malfunctions to be highlighted immediately and rectified long before any potential fire occurs. Deviation from defined parameters will result in automatic shutdown to maintain safety.
- **Fire Protection:** The containers housing the battery units are fire resistant and will be equipped with an automatic fire prevention, detection and suppression system. This will work to ensure that, in the unlikely event of a fire in one of the storage units, early action will be taken to contain the fire.
- **Climate Control:** Each storage unit will be fitted with a Heating, Ventilation, and Air Conditioning (HVAC) system. This HVAC system will ensure that safe ambient temperature and humidity conditions are maintained. As mentioned above, the battery will use a liquid cooling system.

Site Design and Location

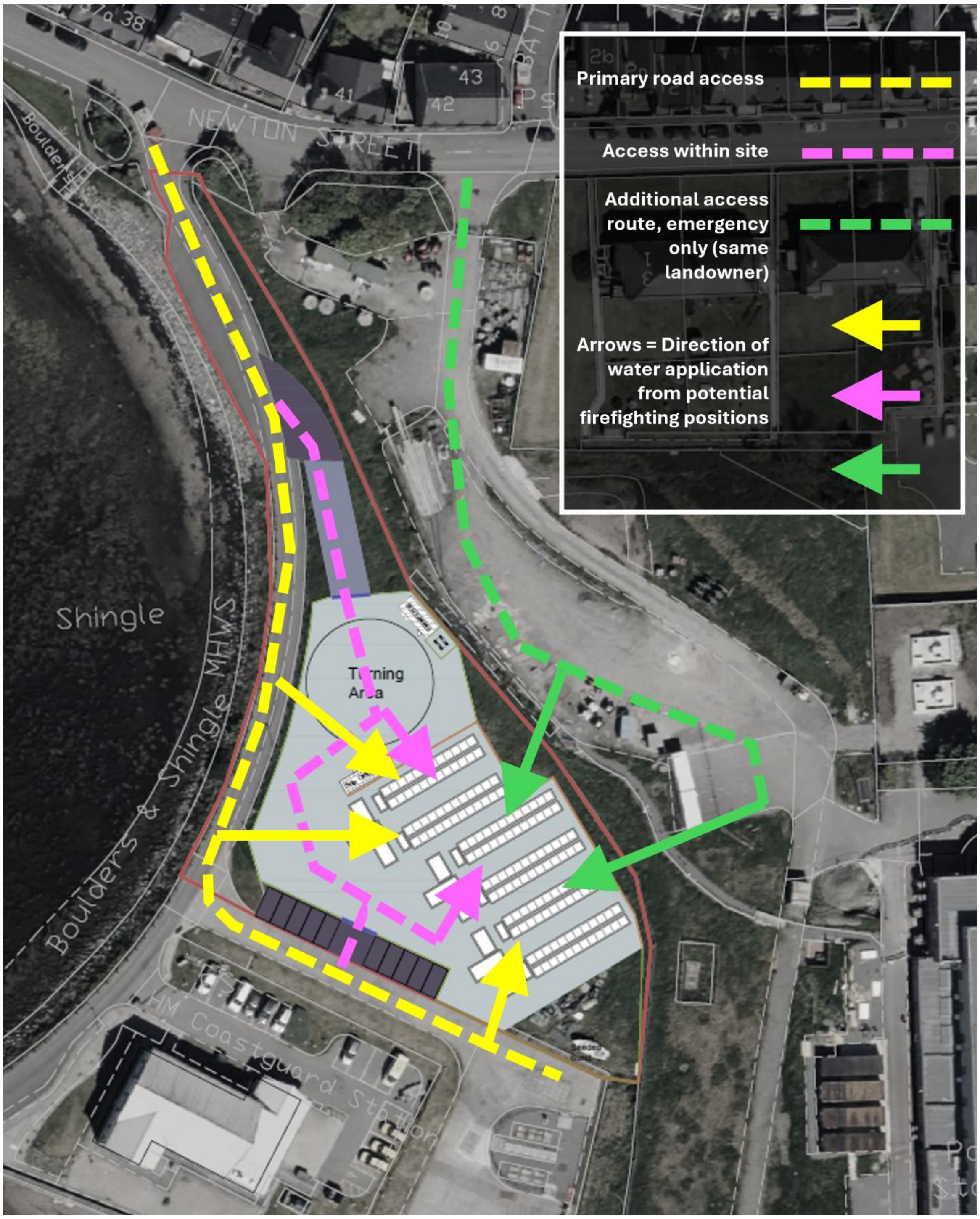
3.11. Beyond the individual battery systems, wider planning and design considerations at a larger scale play an important role in ensuring the safety of battery storage systems. The following safety measures have been taken at the planning stage:

- **Flood Protection:** As discussed in the 'Flood Risk and Drainage' chapter of the Design and Access Statement submitted with the full planning application, flooding is not a significant risk on the site. Battery units are weather sealed and appropriately IP (ingress protection) rated to ensure the internal environment remains dry.
- **Site Location and Access:** The port authority area in which the site is located is accessed from Newton Street. The quayside is not a busy location for members of the public.
- **Battery Location:** The battery storage compound is situated in the southeast part of the site. This maximises the space between the battery units and the residential properties to the north, minimizing the risk of any fire spreading from the units to residential areas. The shortest distance between any of the battery units and the nearest residential property is approximately 73 metres[17]. No battery unit will be within 40 metres of the neighbouring HM Coastguard building.
- **Security Fencing:** The battery storage compound will be securely fenced, ensuring no unauthorised access to the batteries by members of the public, enhancing safety.
- **Firefighting:** In the unlikely event of a fire, there are opportunities to approach the fire from more than one direction, as illustrated in the figure below. This increases the likelihood that a suitable direction of approach is available should wind conditions prevent firefighting from a particular direction. The battery compound is close enough to the road which joins Newton

[17] As per layout submitted with planning application on 18 April 2024.

Street with the marina at Goat Island, such that any fire could likely be fought by the fire brigade from the road itself. However, the distance of 18 metres between the road and the nearest battery unit significantly mitigates the risk of road access being adversely impacted by an emergency incident, certainly when compared to a configuration with batteries directly adjacent to a road. Access arrangements for firefighting will be finalised through ongoing liaison with the fire service.

Figure 4. Firefighting Approach Plan.



- **Fire Service Communication:** As a precaution, the project developers will liaise with local Scottish Fire and Rescue Service during the operational phase to ensure any personnel responding to incidents are fully informed of the specific characteristics of battery storage facilities. The nearest fire station is Stornoway Fire Station, 4 Robertson Road, Stornoway HS1 2LL. This is 0.9 miles from the site by road.
- **Fire Hydrants:** Scottish Water Asset maps show two fire hydrants on Newton Street from which a water supply can be taken for firefighting in the unlikely event of an incident. There is one 140 metres away from the nearest proposed battery container and another at 176 metres.
- **Blast-Proof Acoustic Barrier:** The proposed 4m barrier will be blast-proof as well as providing acoustic protection and will be installed as close as possible to the battery containers. The barrier will be made of appropriately dense materials such as concrete which would further protect neighbouring dwellings from fire or blast in the unlikely event of an emergency. This is in accordance with the recommendations of Merseyside Fire and Rescue, as detailed in their report into a fire in Liverpool[18].
- **Outdoor Layout:** A battery energy storage system can be installed within a large building, or outdoors. Although both options can be made safe, the more common design, and the approach which allows for straightforward mitigation of fire risks is the outdoor system. The drawings submitted with this planning application show an outdoor arrangement with batteries and inverters installed in separate all-weather cabinets.
- **Equipment Separation:** A separation distance of 3.69 metres has been used between rows of batteries to reduce the likelihood that fire could spread between rows, to facilitate servicing of the units and to avoid creating an enclosed space which could pose a risk to personnel. On the matter of separation distances between battery units, guidance provided by the UK's National Fire Chiefs' Council refers to guidance produced by FM Global, an insurance provider specialising in loss prevention (mitigating risks to prevent insurance claims). FM Global's latest guidance recommends a 1.5 metre separation distance. The project therefore provides more than twice the suggested spacing[19].
- **Grid Compatibility and Monitoring:** The connection of battery systems to the grid is carefully controlled and overseen by the grid operator. Access to the grid by the generator (in this case the battery) is controlled by a relay which disconnects the generator from the grid if operation

[18] Page 30, 'Significant Incident Report, Orsted BESS, Carnegie Road, Liverpool, L137HY', authored by Merseyside Fire and Rescue Service, Version 1.2. dated December 2021.

[19] The Fire Chief's guidance is: National Fire Chiefs' Council, 'Grid Scale Battery Energy Storage System Planning' Version 1.0 November 2022. This document references an earlier 6 m separation rule set out by FM Global in paragraph 2.3.2.2. of the 2017 edition of their guidance 'Property Loss Prevention Data Sheets 5-33'. This document has since been updated. At the time of writing, July 2024, the latest version available on the FM Global website is: FM Global, 'Property Loss Prevention Data Sheets 5-33. Lithium-Ion Battery Energy Storage Systems, Interim Revision January 2024'. This version removes the previous 6 m rule at paragraph 2.3.2.2 and replaces it with a 1.5 m rule at the same paragraph 2.3.2.2. for systems using Lithium Iron Phosphate technology "For containerized LIB-ESS comprised of lithium iron phosphate (LFP) cells, provide aisle separation of at least 5 ft (1.5 m) on sides that contain access panels, doors or deflagration vents". Note that the candidate units only have access panels, doors or vents on the side facing the proposed 3.69 m separation.

is non-compliant. Frequency, voltage, generation total, and other electrotechnical specifics must be within the required tolerances or the relay will disconnect the generator. The operation of the relay and switch equipment between the battery and the grid is tested during commissioning and this testing is witnessed by the grid operator.

- **Post-Planning Design:** The design of an energy system is always refined at the post-planning stages. Should planning permission be granted, detailed technical design will be completed prior to procurement and construction. This will review all technical and safety requirements such as earthing, emergency planning, fire, safety, and insurance provider requirements. The standards in place at that time and the latest best practice will be applied and changes made to the design if necessary.

Construction Risk Mitigation

3.12. Measures for the reduction of health and safety risks during construction are touched upon in the Design and Access Statement already submitted with this planning application. These matters are relevant to improving the safety of the battery system but need not be repeated in full here.

3.13. The Construction (Design and Management) Regulations 2015 require clients, designers, contractors and principal designers (roles which are formally defined in the legislation) to act in a manner that reduces risks at the design stage, during construction, and after construction[20].

3.14. Risks specifically relating to the design of the battery system, delivery to the site of battery components, their installation, and ongoing maintenance must be considered by those parties involved in the construction phase. A designer's risk register and project risk register will be produced and kept up-to-date.

3.15. High quality electrical technical equipment such as batteries, inverters, and transformers can be vulnerable during transportation and installation. It is in the client's commercial interest, and it is their obligation under construction safety regulations, to ensure such equipment is handled safely and protected from damage. In turn, this minimises the likelihood of emergencies such as fire when the system is energised. Battery systems may feature shock-vibration sensors (as shown in the photo below) so that batteries that have been exposed to a drop / vibration / impact during transit from the manufacturer to the construction site can be identified.

[20] https://www.hse.gov.uk/construction/cdm/2015/index.htm

Figure 5. Shock Sensor Device Fitted to Battery Unit at Greenspan Energy Battery Project.

3.16. At the close of the construction phase the Principal Designer must produce a health and safety file which contains all relevant health and safety information about the site.

3.17. The battery system is not energised during the construction and installation phase. The system's energisation and commercial operation is only permitted by the installation team after an exhaustive range of commissioning checks. These checks form a part of the commercial handover as the developer takes ownership of the equipment from the supplier.

Ongoing Measures

3.18. Following the construction and commissioning phases the battery system will be maintained under a detailed warranty arrangement and tested regularly to ensure safe and effective operation. This is standard practice for high-value advanced technical equipment in the UK energy sector.

3.19. A relationship with the Scottish Fire and Rescue Service will be maintained to their satisfaction. Point and Sandwick Trust will propose constant liaison with them, together with an annual review of fire prevention and fighting procedures should the local team consider this necessary.

3.20. The information in the health and safety file originating from the construction phase and mentioned above will be referred to on an ongoing basis and forms one of the starting points for continued record keeping, the recording of maintenance work, and the mitigation of fire risks. At all times the safety of people and property will be paramount.

3.21. The operation of contemporary grid scale battery energy storage systems involves 24-hour monitoring and management 7 days per week. This includes equipment temperature and cooling system monitoring and operator alarm notifications. The Greenspan Agency has experience of owning and operating such systems safely.

4. *Industry Experience*

4.1. As the grid connected battery energy storage industry grows to provide an important function in the UK electricity network it is vital that safety lessons are learned from any past incidents. In September 2020 a Battery Energy Storage System (BESS) caught fire at Carnegie Road, Liverpool.

4.2. Although the Liverpool incident was a significant one, no one was injured, and it is the only documented incident of a BESS fire in the UK.[21]

4.3. The Liverpool incident is detailed in the following reports:

- *'Fire Investigation Report 132-20, Ørsted BESS, Carnegie Rd, Liverpool',* authored by Merseyside Fire and Rescue Service, March 2022.
- *'Significant Incident Report, Orsted BESS, Carnegie Road, Liverpool, L137HY',* authored by Merseyside Fire and Rescue Service, Version 1.2. dated December 2021.
- *'Carnegie Road Energy Storage System Failure Response, Recovery, And Rebuild Lessons Learned*'. EPRI, April 2023.

4.4. The purpose of the third document is *'to educate the industry on lessons learned and facilitate the development of best practices'* (pdf page 2). It explains that *'The Carnegie Road BESS was first energized in December 2018 and commissioned in May 2019'*. It makes clear that the battery technology at Carnegie road is nickel manganese cobalt NMC (pdf page 3).

4.5. The EPRI report referenced above also points out a change in the typical layout of the technology at BESS sites since the Liverpool system was designed.

> *"There has been a shift in system design across the industry since the Carnegie Road BESS was installed in 2018. Older system designs tended toward a single ISO container lined with battery racks along the walls, leaving a small accessible alley through the container – similar to the Carnegie Road BESS... Some newer system designs use smaller, modularised cabinets with a few racks of batteries. These cabinets are accessible from the outside so personnel are not confined inside a container when performing their duties. The system layout also limits damage because of thermal runaway and allows a more targeted first responder approach in the event of a fire.*

[21] House of Commons Library, Research Briefing, Battery Energy Storage Systems (BESS), 24 April 2024.

Although newer designs like the one described above may improve overall site and system safety, it requires more land area and may increase construction costs[22]".

Figure 6. Example Small Cabinet Based Battery System.
Candidate Technology for the Battery Point Site.

4.6. The battery units at the Liverpool installation, provided by LGChem, were subject to a product recall at the time of the fire[23]. Product recalls are a feature of many industry sectors, such as food, automotive, etc. Enquiries into the root cause of the Liverpool incident were inconclusive.

4.7. Although contact had been made with the local fire service by the operator of the Carnegie Road facility and an Emergency Response Plan (ERP) agreed, this ERP was not known to the fire crew who initially attended. In contrast, the Stornoway project will agree a response plan in advance with the local Fire and Rescue Service.

4.8. The current design of the project proposed at Battery Point Stornoway differs from the Carnegie Road Liverpool installation in the following ways which lower the likelihood of fire:

1. The Battery Point design uses liquid cooled batteries, whereas the Liverpool system was air-cooled.
2. The Battery Point design uses lithium iron phosphate batteries rather than the nickel manganese cobalt used in Liverpool.
3. The Battery Point design uses discrete smaller cabinets, rather than large 'shipping' type containers in which more batteries are housed together.
4. In the unlikely event that equipment was subject to a product recall, the installation would be de-energized and not used until the equipment had been replaced.

[22] Page 10, *'Carnegie Road Energy Storage System Failure Response, Recovery, And Rebuild Lessons Learned*'. EPRI, April 2023.
[23] Paragraph 2.2.2, Page 4, *'Carnegie Road Energy Storage System Failure Response, Recovery, And Rebuild Lessons Learned*'. EPRI, April 2023.

4.9. In addition to the differences above enhancing safety for the Battery Point project those recommendations by Merseyside Fire and Rescue set out on pages 28 – 32 of their Significant Incident Report will be implemented. These recommendations will influence the design, procurement, and operational phases of this project.

5. Other Matters Raised by Members of the Public

5.1. Members of the public have raised concerns about fire safety in comments submitted to the Comhairle in respect of this planning application. Many of the matters raise by them have been covered in the topics discussed earlier in this report.

5.2. One of the public comments refers to National Fire Chiefs Council guidance[24]. The development team are aware of this guidance and the Battery Point Energy Storage Park has been designed with it in mind. This guidance suggests an initial minimum distance of 25 metres from the battery energy storage system (BESS) units to any occupied buildings. As stated above, the shortest distance between any of the proposed battery units and the nearest residential property is approximately 73 metres. This provides almost triple the 25m recommended separation in terms of residential dwellings. Moreover, no battery unit will be within 40 metres of the neighbouring HM Coastguard building, also exceeding the 25 m recommendation.

5.3. The National Fire Chiefs Council guidance also suggests a standard minimum spacing between battery (aka BESS) units of 6 metres unless suitable design features can be introduced to reduce that spacing. The guidance itself references a document[25] produced by FM Global, an insurance provider specialising in loss prevention (mitigating risks to prevent insurance claims). However, the FM Global document has since been superseded and a 2024 version is now available[26]. The 2024 version removes the 6 m rule and replaces it with a 1.5 m rule at paragraph 2.3.2.2. The actual distance between the proposed BESS units is 3.69 metres, so more than double the recommended separation distance will be provided (see also detailed discussion within a footnote earlier in this Greenspan report).

[24] National Fire Chiefs Council guidance – "Grid Scale Battery Energy Storage System Planning – Guidance for FRS". Accessible here.
[25] FM Global, (2017) Property Loss Prevention Data Sheets, 5-33, 'ELECTRICAL ENERGY STORAGE SYSTEMS'.
[26] FM Global (January 2024) Property Loss Prevention Data Sheets, 5-33, 'LITHIUM-ION BATTERY ENERGY STORAGE SYSTEMS'.

6. Public Perception, Risk and New Technology

6.1. It is vital that projects for which planning permission is sought are safe. The move to low-carbon energy solutions necessitates the introduction of technologies which members of the public may be unfamiliar with. The public are absolutely right to ask questions about the safety of any change in their neighbourhood. Technology required for the transition from fossil fuels to renewables includes electric vehicles, wind turbines, solar panels, heat pumps, etc. None of these are entirely safe. Risks include electrocution and fire. But the risks are usually negligible and mitigated by appropriate design and use. The fossil technologies they replace bring their own risks of fire, explosion or pollution, but we have become accustomed to them. Similarly, most buildings and other development which require planning permission, can be subject to fire, accident or emergency scenarios.

6.2. In seeking to understand the risks posed by newer technologies it is important that research is carried out in a manner which allows an assessment of the actual risks involved.

6.3. Society is adopting emerging technologies and doing so safely. In the case of batteries, a typical commercial airplane will have battery backup power systems on board for reasons of safety and the customers, between them, will be carrying hundreds of battery powered electrical devices, but the level of risk is considered acceptable.

6.4. Grid-scale batteries are a relatively new technology but the National Fire Chiefs Council and National Grid have recognised the technology as 'a fundamental part of the UK's move toward a sustainable energy system[27]' and as playing 'an increasingly pivotal role'[28]. Accordingly, the benefits of grid scale batteries are now being deployed on a large scale UK-wide.

[27] Page 1, National Fire Chiefs' Council, 'Grid Scale Battery Energy Storage System Planning' Version 1.0 November 2022
[28] https://www.nationalgrid.com/stories/energy-explained/what-is-battery-storage

7. Conclusions

7.1. This report has introduced the health and safety issues arising from grid scale electricity storage battery systems.

7.2. The size of the UK BESS sector has been set out, in the context of there having been one documented fire.

7.3. Key risk mitigation measures to be provided with this project include:

- Battery System Design – Appropriate design within the individual battery units and systems.
- Site Design and Location – Larger scale design and planning considerations, such as site selection and separation from nearby properties.
- Construction Risk Mitigation – A responsible approach to equipment installation, testing and commissioning.
- Ongoing Measures – An approach to operation which minimises risks.

7.4. The site exceeds the recommended 25 m separation distance to occupied buildings.

7.5. Industry experience has been considered and several differences have been noted between this project and a BESS installation which caught fire in Liverpool in 2020 (this was a serious incident but no one was injured). Recommendations arising from the Liverpool incident are being incorporated into the design, procurement and operational approach for the project at Battery Point Stornoway.

7.6. The developer, The Point and Sandwick Trust, is fully committed to operating the installation safely.