

V2

September 2026



DISCUSSION DOCUMENT FOR DOMESTIC BATTERY STORAGE

...SAME PRINCIPLES FOR LARGER SCALE

RICHARD DUNBAR
PARK LODGE INTERNATIONAL
www.parklodgeinternational.com

Foreword

As we move towards a future increasingly dependent upon renewable energy, the adoption of solar photovoltaic panels and battery energy storage systems is becoming more widespread. With emerging legislation enabling technologies such as plug-in solar panels, and the possibility of plug-in battery systems becoming more commonplace, it is essential that manufacturers, suppliers, installers and users fully understand the potential fire and thermal-event risks associated with these technologies.

This is particularly important as the market continues to expand through consumer sales and, in some cases, DIY installations. Social media and online advertising provide clear evidence of the rapid growth in this sector but also highlight instances where the importance of fire safety and appropriate installation practices may not be fully understood.

This document has been prepared from practical experience, consideration of relevant standards and guidance, and wider research undertaken during its development. Its purpose is to raise awareness, encourage discussion and, most importantly, promote a proactive approach to fire safety as renewable energy technologies become increasingly integrated into our homes and buildings.

The recommendations and observations contained within this document should not be interpreted as a replacement for statutory requirements, recognised standards or manufacturers' instructions. However, there are several areas where my personal view is that we should aim to go beyond minimum requirements and adopt a more precautionary approach.

I believe that **60 minutes of fire resistance should be the objective for battery energy storage installations**, rather than 30 minutes where this can reasonably be achieved. I also believe that fire detection arrangements need to take greater account of the occupants, the building and the specific risk, rather than relying simply upon several standalone, battery-powered detectors. A clearly understood domestic fire-escape plan, shared by all occupants, is a simple but important part of this approach.

The location of isolation devices also deserves consideration. In my opinion, isolation should be readily accessible, ideally close to a final exit, rather than necessarily being positioned immediately adjacent to the battery or control equipment. This could allow a system to be isolated more readily in an emergency without requiring access to the area containing the equipment.

There is also an opportunity to improve the way these installations are identified. **External markings indicating the presence and location of battery energy storage systems could provide valuable information to attending fire and rescue personnel**, particularly where the equipment is located within garages, outbuildings or other less obvious areas.

Other practical considerations include the secure support of wiring, particularly at ceiling level in garages and external locations, using appropriate metal fixings to reduce the possibility of cables becoming detached or creating additional hazards for fire crews. Fire stopping should be undertaken using tested and certified materials providing the required fire resistance; general-purpose expanding foam should not be considered an appropriate substitute. Intumescent products and other tested fire-stopping solutions can provide an important additional layer of protection.

Early detection is another area that warrants greater attention. Battery systems incorporating detection capable of identifying abnormal temperature, rate of temperature rise or potentially hazardous vapours could provide occupants with valuable additional warning. In my view, consideration should be given to **staged or escalating alarm arrangements**, providing an early warning before conditions develop into a significant thermal event.

Similarly, separation distances deserve careful consideration. While a distance of 1 metre may be referenced within some guidance, my preference would be for **1.8 metres where reasonably practicable**, providing an increased degree of separation between battery systems and other combustible materials or exposures.

Finally, relatively simple proactive measures should not be overlooked. Devices such as colour-changing cable clips and temperature-sensitive indicators can provide a visible indication that abnormal heating may be occurring. Such measures have the potential to identify developing problems before they become a serious fire-safety issue.

The transition to renewable energy is both necessary and inevitable. However, **the drive towards a greener future must not come at the expense of fire safety**. The technologies discussed within this document are developing rapidly, and the way in which they are installed, protected and managed today will influence the safety of occupants, installers and fire and rescue personnel for many years to come.

This document is therefore intended to stimulate discussion, challenge existing thinking where appropriate and encourage everyone involved in the renewable energy sector to strive for the highest practical standard of fire safety — not simply the minimum that is required.

BESS systems should not be installed within loft or roof spaces under any circumstances. Although current standards are not retrospective, existing installations in these locations should be considered unsuitable and relocation should be strongly recommended.

Under no circumstances should occupants attempt or be advised to attempt to extinguish a battery in thermal runaway.

Better fire safety should be an integral part of the Green Agenda.

Critical Note

The Reality of the Risk

When we casually state that a BESS should “**not be placed on a means of escape,**” we need to stop and seriously consider what that actually means in a house or apartment.

Consider a typical two-storey house. Three bedrooms and associated facilities are located upstairs, with a **single staircase providing the only means of escape** to the ground-floor hallway. That hallway connects directly to the kitchen and two reception rooms.

Now consider where the BESS is often recommended for installation: **in the dining area**. It looks neat, it is convenient, and it provides the installer with easier access to the consumer unit and grid connection. It can also be cheaper and simpler to install.

But what happens when that battery fails?

Battery incidents may be relatively rare, but they are real, they are occurring, and the consequences can be catastrophic. Fire safety therefore cannot be treated as an afterthought simply because the probability of an incident is considered low.

A BESS installation should provide **early, automatic warning of abnormal battery conditions**. The battery management system should be capable of transmitting an alarm to the building's fire detection system where abnormal temperature rise or excessive temperature is detected. A notification appearing on someone's mobile phone is not an adequate life-safety strategy. Nor is a BESS that simply emits an audible warning from the unit itself, comparable to a smoke detector indicating a low battery.

Early warning is critical.

If a battery enters thermal runaway, the event does not necessarily begin with visible flame. The battery can generate and release a large volume of hot, toxic and potentially ignitable gases in a very short period. Those gases can rapidly migrate into the surrounding building, including corridors, hallways and stairways.

So ask the uncomfortable question:

At 2:00 am, when the family is asleep upstairs, what protects the staircase?

If the BESS is located within, or immediately adjacent to, the only escape route, the battery has potentially been placed between the occupants and their route to safety.

That should fundamentally change the way we assess the installation.

The first and most obvious control should be to **remove the hazard from the building and locate the BESS externally**, where the risk to occupants and the means of escape can be substantially reduced.

If external installation is not reasonably practicable, then the design needs to consider significantly more robust measures, potentially including **fire-resisting separation, protection of escape routes, detection and alarm interfaces, ventilation and, where appropriate, suppression systems**. Simply installing the battery and relying on an app notification is not an acceptable substitute for a properly considered life-safety strategy.

I can already hear the objection:

“This is the real world. You cannot expect that level of fire safety in an ordinary house.”

But that is precisely the point.

We cannot make life safety a game of chance.

The fact that an incident is unlikely does not make the consequences acceptable. When the potential outcome is a blocked escape route, toxic gas exposure, fire, explosion, life-changing injury or death, the question should not simply be *“How likely is it to happen?”*

The question should be:

“If it does happen, have we designed the installation so that the occupants can still get out alive?”

Insurance may pay to rebuild a house.

It cannot rebuild a life, undo a life-changing injury, or bring someone back.

That is why the location of a domestic BESS must be treated as a **life-safety decision, not simply an installation convenience or aesthetic choice**.

DOMESTIC BESS FIRE RISK ASSESSMENT

Guiding Principle

A BESS should not be given a low fire-risk rating simply because the battery is certified, the installer is competent, the system has a BMS, or the installation complies with BS 7671.

The fire risk assessment must consider the complete system, its location, the building construction, occupants, escape arrangements, surrounding combustibles, detection, ventilation, fire separation and the consequences of thermal runaway.

Guidance and Field Checklist for Fire Risk Assessors

Subject: Battery Energy Storage Systems in domestic premises

Primary references: PAS 63100:2024; BS 7671:2018+A4:2026 Chapter 57; manufacturer's instructions; applicable fire-safety/building requirements.

Important: This handout is an assessment aid, not a substitute for the full standards. PAS 63100:2024 is specifically intended to address fire protection of BESS installed in dwellings and covers battery/fault management and installation locations.

BS EN IEC 62619:2022 is a British/European adoption of the international IEC 62619:2022 standard. It sets out safety requirements and tests for rechargeable lithium cells and batteries used in industrial applications, particularly stationary energy-storage applications.

In simple terms - It is a battery safety standard designed to demonstrate that a lithium battery is sufficiently safe when subjected to foreseeable abnormal conditions and faults.

1. PURPOSE OF THE ASSESSMENT

The assessor should establish:

- A. What is installed?**
- B. Where is it installed?**
- C. What could cause the BESS to ignite?**
- D. What happens if thermal runaway occurs?**
- E. Can occupants escape safely?**
- F. Can fire spread beyond the battery location?**
- G. Can firefighters' approach and deal with the incident safely?**
- H. Are adequate control measures in place?**

The fundamental principle is:

Do not assess the BESS merely as an electrical appliance. Assess it as a potential source of fire, heat, smoke, flammable and highly toxic gases within the building.

PAS 63100 is specifically intended to reduce the likelihood of batteries becoming an ignition source and to limit the consequences if a battery fire occurs.

2. STEP ONE – IDENTIFY THE BESS

Record:

Item	Information
Manufacturer	
Battery model	
Serial number	
Battery chemistry	
Total capacity	___ kWh
Number of modules	
Nominal voltage	
Maximum DC current	
Inverter/PCE	
BMS	
Installation date	
Installer	
Location	
Indoor/outdoor	
PV connected?	Yes / No
EV charging connected?	Yes / No
Other generation/storage	

Documents to request

- Battery manufacturer's instructions
- Inverter manufacturer's instructions
- Battery datasheet
- Installation drawings
- Electrical Installation Certificate
- Schedule of inspection
- Schedule of test results
- Commissioning documentation – all test results done according to BS EN IEC 62619 or UL 9540A or equivalent as well as non-battery tests.
- PAS 63100 conformity documentation where applicable
- Maintenance records
- BMS information
- Fire detection information
- Previous fault/alarm records

3. STEP TWO – ESTABLISH THE SCOPE

Before assessing compliance, determine whether PAS 63100 is applicable.

PAS 63100:2024 covers BESS installations in dwellings and has defined exclusions, including **domestic dwellings exceeding 200 m², second-life batteries, high-risk residential buildings, alternative energy-storage technologies and certain systems connected upstream of the distributor's cut-out/consumer meter.**

Overview of PAS 63100

Key Requirements and Guidelines

- **Preferred Location:** The guidance states that storage batteries should ideally be installed outdoors where practicable.
- **Banned Locations:** Batteries must **not** be installed in bedrooms, sleeping quarters, lofts or roof spaces, escape routes (such as hallways, staircases, and landings), or cupboards opening into sleeping areas.
- **Outdoor Distances:** If placed outside, they must maintain a safe distance (typically at least 1 meter) from doors, windows, escape routes, and ventilation ports.
- **Scope:** The standard applies to domestic properties with a floor space up to 200m² and low-voltage stationary secondary battery systems exceeding 150Wh.
- **Safety Focus:** It addresses component physical safety, battery management systems, power conversion equipment, protection against mechanical impact, and fail-to-safe operations to mitigate fire risks

Record:

- PAS 63100 applicable.
- PAS 63100 not applicable — reason recorded.
- Alternative standard/guidance identified.
- Specialist assessment required.

Do not automatically conclude that an installation is acceptable because it falls outside PAS 63100.

It may simply mean that **another assessment route is required.**

4. STEP THREE — IDENTIFY THE BATTERY CHEMISTRY

Record the chemistry rather than simply writing:

“Lithium-ion.”

For example:

- LFP — lithium ferrous phosphate (commonly called lithium iron phosphate)
- NMC — nickel manganese cobalt
- NCA — nickel cobalt aluminium
- LTO — lithium titanate
- Other

Why this matters

Different battery chemistries can have different:

- thermal characteristics;
- energy densities;
- thermal-runaway behaviour;
- gas-generation characteristics;
- propagation characteristics;
- manufacturer’s installation requirements.

Do not use chemistry alone to determine the risk.

The complete battery/system design and manufacturer’s data must be considered.

5. STEP FOUR — ASSESS THE LOCATION FIRST

The location is one of the most important parts of the FRA.

Ask:

If this battery experienced thermal runaway, where would the fire, heat and gases go?

Then assess:

- occupants;
- escape routes;
- doors;
- windows;
- ventilation;
- combustible materials;
- fire-resisting construction;
- adjacent rooms;
- neighbouring properties;
- firefighters' access.

6. LOCATION A — OUTDOOR BESS

Outdoor installation is generally preferred under the PAS approach but **outdoors does not automatically mean low risk.**

Check:

- Battery genuinely located outdoors.
- Not within an escape route.
- Not obstructing a doorway.
- Not immediately below a window.
- Not adjacent to ventilation openings.
- Separation distances checked.
- Manufacturer's clearances complied with.
- Physical impact protection provided where necessary.
- Vehicle impact considered.
- Combustible materials removed.
- Wall construction assessed.
- Cable penetrations fire stopped.
- Cavity barriers considered.
- Battery enclosure suitable for external exposure.
- Water ingress/drainage considered.
- Emergency isolation identified.
- Fire-service access considered.

Critical question

- **Could a battery fire expose the dwelling's windows, doors or ventilation openings to flames, hot gases or radiant heat?**
- **Are fire resisting doors and windows needed?**

7. EXTERNAL WALL INSTALLATIONS

Attention should be paid to the wall itself.

Check:

- Wall construction identified.
- Cavity wall?
- Timber-frame construction?
- Combustible external cladding?
- Insulated construction?
- Fire performance established.
- Battery fixings suitable.
- Wall penetrations appropriately protected.
- Cavity barriers present where required.
- No route for fire to bypass the wall's fire performance.

PAS 63100 requires an external-wall BESS not to compromise the fire performance of the wall, with appropriate treatment of penetrations and cavities.

Assessor's question

If the BESS burns against this wall, what is the likely route for fire to enter the building?

8. GARAGE

A garage requires scrutiny.

Identify:

- Attached garage.
- Integral garage.
- Detached garage.
- Garage below accommodation.
- Garage connected directly to dwelling.

Examine:

- Door between garage and dwelling.
- Fire resistance of separating construction.
- Door condition and fire performance.
- Cable penetrations.
- Ventilation.
- Vehicle impact risk.
- Petrol/diesel storage.
- LPG cylinders.
- Paints/solvents.
- Timber.
- Cardboard.
- Household storage.
- Other batteries.
- EV charging equipment.

Critical assessment

Could a BESS fire prevent occupants from using the garage-to-house route as an escape route?

Also consider the opposite:

Could a vehicle or other garage fire expose the BESS to sufficient heat to initiate battery failure?

9. LOFT / ROOF SPACE

BESS systems should not be installed within loft or roof spaces under any circumstances. Although current standards are not retrospective, existing installations in these locations should be considered unsuitable and relocation should be strongly recommended.

If batteries have been installed in a loft, then particular attention to the following should be made.

Check:

- Battery location accessible.
- Safe maintenance access.
- Safe emergency isolation – not in loft.
- Structural support adequate, survey report.
- Consider point loading.
- Battery weight known and does not exceed recommended weights for structure.
- Temperature within manufacturer's limits (max/min temperatures recorded)
- Ventilation adequate, what, how, air changes.
- Ventilation discharges appropriately, where.
- Fire separation from accommodation, how and standard of fire resistance
- Ceiling construction.
- Roof construction.
- Timber proximity.
- Insulation proximity (non-flammable insulation only).
- Cable penetrations, sealed.
- Smoke/gas migration routes.
- Fire detection, linked.

Red flags

- Battery surrounded by combustible roof timbers.
- Battery buried in insulation.
- Restricted access.
- No meaningful ventilation.
- Battery directly above bedrooms.
- No appropriate fire separation.
- No safe means of isolation.

The assessor should not accept the argument:

“The battery manufacturer permits loft installation.”

That only answers part of the question.

The FRA must consider **the actual building and consequences of a fire in that location.**

10. UTILITY ROOM / CUPBOARD

This is often where BESS installations create the greatest potential conflict between electrical convenience and fire safety.

Check whether the battery is:

- In a habitable area.
- Adjacent to a bedroom.
- Adjacent to an entrance.
- On an escape route.
- Beside a boiler.
- Beside a tumble dryer.
- Beside other heat-producing equipment.
- Beside combustible storage.
- In a cupboard.
- In a purpose-built enclosure.

Fire separation

Where indoor installation is within the scope of PAS 63100, examine the required fire-resisting construction rather than assuming ordinary plasterboard construction is sufficient.

PAS 63100 addresses fire-resisting separation and other measures intended to contain the consequences of a BESS fire.

11. DETACHED OUTBUILDING

Potentially a good location but assess it properly.

Check:

- Detached from dwelling.
- Not used as accommodation.
- No bedroom.
- No significant combustible storage.
- Adequate ventilation.
- Weather protection.
- Fire spread to dwelling considered.
- Cable route to dwelling considered.
- Cable penetrations protected.
- Physical security.
- Impact protection.
- Fire-service access.
- Emergency isolation.

Important

A garden shed containing a BESS, lawnmower, petrol cans, timber, cardboard and other combustible materials is **not equivalent to a purpose-designed energy-storage enclosure**.

12. ESCAPE-ROUTE ASSESSMENT

This should be a separate part of the FRA.

Draw the battery onto the escape plan.

Then identify:

BESS → fire/smoke → escape route → occupants

Ask:

- Is the BESS on the escape route?
- Is it beside an escape route?
- Could smoke enter the escape route?
- Could radiant heat make the route unusable?
- Could fire block the only exit?
- Is an alternative escape route available?
- Would occupants know what to do?
- Are vulnerable occupants present?

Concern

Bedrooms located above or immediately adjacent to the BESS deserve careful consideration because occupants may be asleep when a failure occurs.

Remember, the build-up of a vapour cloud that ignites will damage walls. The vapour cloud has its own mind and does not follow the rules.

13. VENTILATION

Do not simply record:

“Ventilation provided.”

Determine **what the ventilation does**.

Check:

- Fresh air supplied.
- Air discharged to outside (not a risk to means of escape, etc.)
- Ventilation route identified.
- Ventilation cannot inadvertently spread fire.
- Ventilation does not compromise fire compartmentation.
- Ventilation complies with manufacturer requirements.
- Ventilation remains functional under relevant conditions.

Key question

Where will the gases produced by a failing battery go?

And then:

Where will those gases accumulate?

14. THERMAL RUNAWAY — ASSESS THE CONSEQUENCE

The assessor should understand the sequence:

Cell failure



Heat generation



Electrolyte decomposition



Gas generation



Pressure increase / venting



Possible ignition



Thermal runaway



Propagation



Battery fire

A lithium-ion battery entering thermal runaway does not necessarily result in immediate flaming combustion. The cell may instead undergo violent decomposition and venting, releasing a potentially flammable and highly toxic mixture of gases, which can include hydrogen, carbon monoxide, hydrogen fluoride, hydrogen cyanide and other hydrocarbon species.

Where these gases accumulate within a confined or inadequately ventilated space, a flammable atmosphere can develop. Once the concentration reaches the applicable lower explosive/flammable limit, the introduction of an ignition source can result in rapid deflagration and, where confinement and pressure conditions permit, a potentially destructive explosion.

The absence of visible flame should therefore not be interpreted as an absence of fire or explosion risk. Off gassing during thermal runaway can create a significant secondary explosion hazard, particularly within enclosed spaces where gases are permitted to accumulate.

The fire risk assessment should therefore consider **more than visible flame**.

Potential hazards include:

- heat;
- smoke;
- toxic combustion products - some 100 trace organics;
- flammable gases;
- pressure effects;
- rapid fire development;
- propagation between cells/modules.

15. BATTERY MANAGEMENT SYSTEM

The assessor does not need to become a BMS engineer but should establish what protection exists.

Ask the installer/manufacture:

Does the BMS monitor:

- Cell voltage?
- Temperature?
- Current?
- State of charge?
- Cell imbalance?
- Fault conditions?

What happens when a fault is detected?

- Alarm?
- Battery shutdown?
- Inverter shutdown?
- Isolation?
- Remote notification?
- Fault recorded?

Ask specifically:

“Show me what happens when the BMS detects an over-temperature condition.”

This is a much more useful question than simply asking:

“Does it have a BMS?”

16. FIRE DETECTION

Assess the **whole dwelling**, not merely the battery room.

Check:

- Smoke detection.
- Heat detection where appropriate.
- Detector location.
- Detector coverage.
- Interconnection.
- Alarm audibility.
- Battery backup.
- Testing arrangements.
- Occupant awareness especially minors.

Important distinction

Detection does **not prevent thermal runaway**.

Its purpose is to:

Provide early warning so occupants can escape before the fire compromises their means of escape.

- Any fixed firefighting installation within the battery casing can only slow the process.

17. COMBUSTIBLE LOAD

Map the area around the BESS.

Record:

- Timber.
- Cardboard.
- Plastics.
- Paint.
- Solvents.
- LPG.
- Fuels.
- Household chemicals.
- Other batteries.
- E-bike/e-scooter batteries.
- EV charging equipment.
- Stored equipment.

Principle

Don't assess the battery in isolation.

Assess:

Battery + surroundings + building + occupants.

18. ELECTRICAL SAFETY – WHAT THE FIRE RISK ASSESSOR SHOULD VERIFY

The assessor isn't replacing the competent electrical installer.

However, the assessor should verify that evidence exists of:

- Electrical Installation Certificate – consider torque settings
- Appropriate inspection/testing.
- Correct isolation.
- Appropriate protective devices.
- Battery/inverter compatibility.
- Appropriate cable installation.
- Identification and warning labels.
- Maintenance arrangements.

19. EMERGENCY ISOLATION

Locate:

AC isolation

- Identified.
- Accessible.
- Clearly labelled.

DC isolation

- Identified.
- Accessible.
- Clearly labelled.

Battery emergency information

- Battery location identified.
- Battery chemistry identified.
- Capacity identified.
- Manufacturer identified.
- Emergency contact available.

20. FIREFIGHTER CONSIDERATIONS

Ask:

If firefighters arrive and are told there is a BESS, what information will they have?

Check:

- Battery location known.
- Battery type known.
- Isolation points identified.
- Access route known.
- Building layout available.
- Relevant hazards identified.
- PV system identified.
- EV charging system identified.
- Other battery systems identified.

For larger or unusual systems, the assessment should consider whether **site-specific emergency planning or specialist advice** is warranted.

21. OCCUPANT FACTORS

Under no circumstances should occupants attempt or be advised to attempt to extinguish a battery in thermal runaway.

The same BESS can present different risks in different homes.

Record:

- Number of occupants.
- Children (children often do not hear alarms that are provided without voice)
- Elderly occupants.
- Mobility impairment, even temporary.
- Sensory impairment.
- Sleeping arrangements.
- Alternative escape routes.
- Ability to respond to an alarm.
- Occupants requiring assistance.

Identify the capability of occupants, including people with disabilities or frailty, as a factor that should be considered in a fire risk assessment.

22. MAINTENANCE AND ONGOING RISK

A BESS isn't "safe forever" because it was correctly installed.

Check:

- Manufacturer maintenance requirements.
- Inspection intervals.
- Software/firmware updates.
- BMS fault history.
- Inverter fault history.
- Battery alarms.
- Temperature alarms.
- Previous repairs.
- Water ingress.
- Physical damage.
- Corrosion.

- Changes to surrounding building.
- Changes in combustible storage.
- Changes in occupancy.

Ask the homeowner:

“Has the battery ever displayed a warning, fault or alarm?”

and:

“Has anybody ever repaired, opened, modified or reset it?”

23. WARNING SIGNS THAT REQUIRE INVESTIGATION

Look for:

Physical

- Swelling
- Cracking
- Distortion
- Discolouration
- Corrosion
- Burn marks
- Melted plastic
- Damaged connectors
- loose modules
- Water ingress

Operational

- Repeated BMS alarms
- Unexpected shutdown
- Excessive temperature
- Reduced capacity
- Abnormal charging
- Inverter faults
- Repeated resets

Environmental

- Excessive heat
- Poor ventilation
- Combustible storage
- Physical impact
- Flooding
- Condensation

24. HIGH-RISK FINDINGS

Regard the following as **significant findings requiring immediate further consideration:**

● Location

- BESS on an escape route.
- BESS immediately adjacent to an exit.
- BESS within/adjacent to sleeping accommodation.
- Inadequately protected loft installation.
- BESS surrounded by combustible storage.
- BESS adjacent to significant heat source.

● Building

- Inadequate fire separation.

- Unprotected penetrations.
- Unprotected cavity.
- Combustible construction immediately adjacent.
- External installation compromising the building envelope.

● **Battery**

- Damaged/swollen battery.
- Unknown battery chemistry.
- Unknown manufacturer.
- Second-life battery where PAS 63100 applies.
- Unexplained BMS alarms.
- Evidence of overheating.

● **Management**

- No installation documentation.
- No maintenance arrangements.
- No emergency isolation information.
- Occupants unaware of the BESS.
- No suitable fire detection.
- Installer cannot demonstrate competence/compliance.

25. THE “WORST CREDIBLE SCENARIO” TEST

A useful approach for the risk assessor is to consider:

Scenario:

One battery module experiences internal failure at 02:00 while occupants are asleep.

Then ask:

1. Where does the first heat/flame appear?
2. Does thermal runaway propagate?
3. What combustible materials are nearby?
4. Where do gases go?
5. Where does smoke go?
6. Does fire enter the dwelling?
7. Which escape route becomes affected first?
8. Can occupants still escape?
9. Can firefighters reach the battery?
10. Can the battery be isolated?
11. Can the fire spread to the structure?
12. Could a second battery, PV system or EV charging equipment become involved?

This gives the assessor a much more meaningful assessment than simply recording:

“10 kWh lithium battery installed – risk low.”

26. RISK EVALUATION

After completing the physical assessment, consider four separate risks:

Risk	Assessment
Likelihood of ignition	Low / Medium / High
Likelihood of thermal runaway propagation	Low / Medium / High
Potential fire development	Low / Medium / High
Consequences to occupants/property	Low / Medium / High

Then consider the **overall risk**, taking account of the controls provided.

27. CONTROL MEASURES

Possible controls include:

Elimination

- Remove BESS
- Relocate BESS from an unsuitable internal location.
- Avoid installation in escape routes.
- Remove combustible storage.

Engineering controls

- Appropriate enclosure.
- Fire-resisting separation.
- Ventilation.
- Fire detection.
- Physical impact protection.
- Appropriate isolation.
- BMS protection.

Administrative controls

- Inspection.
- Maintenance.
- Fault monitoring.
- Emergency procedures.
- Occupant information.
- Fire-service information.

28. FINAL ASSESSOR'S DECISION

The assessment should conclude with one of four outcomes:

● **ACCEPTABLE**

The BESS has been assessed, and appropriate controls are in place.

● **ACCEPTABLE SUBJECT TO ACTION**

Risk is adequately controlled provided specified remedial actions are completed.

● **FURTHER SPECIALIST ASSESSMENT REQUIRED**

Technical information or specialist electrical/fire engineering input is required before the risk can be properly assessed.

● **UNACCEPTABLE / IMMEDIATE ACTION**

The installation presents a significant uncontrolled risk requiring urgent remedial action.



richard@parklodgeinternational.com

www.parklodgeinternational.com