

CHECKLIST: SITE SAFETY

Battery Energy Storage System BESS) Checklist for Spatial Planning, Hazard Control & Emergency Response

Introduction

This checklist offers best-practice guidance for the safe deployment of BESS installations at site level. It addresses spatial planning, emergency access, emissions, and environmental risk mitigation.

Preventive Measures

Objective: Design the site to minimise risk during normal operation and emergencies.

O Location Requirements

For Developers / Authorities / Planners:

- Conduct site-specific risk assessments addressing fire hazards, drainage and runoff, proximity to communities, and environmental factors such as wind and flooding.
- Ensure regulatory requirements scale with system size.
- Define clear emergency escape routes and integrate firefighting strategies.

|↔| Container Spacing

For Design Engineers / Installers:

- □ Use large-scale fire test data to define separation distances.
- Ensure spacing supports emergency access, thermal dissipation, and safe maintenance.

PCS & Infrastructure Spacing

For Engineers / Risk Analysts:

- Maintain safe distances between BESS containers and PCS, transformers, and other power infrastructure.
- Consider electrical arcing, heat generation, and flammable materials in design.
- Use fire barriers where space is limited.

Spacing to Environment (Buildings, Fences, Vegetation)

For Urban Planners / Safety Officers:

- Provide buffer zones to protect structures, people, and ecosystems.
- Clear vegetative firebreaks and define safety perimeters.
- Collaborate with local stakeholders in planning approvals.



Containment Measures

Objective: Prevent environmental contamination and manage hazardous material flow.

) Wastewater & Spill Containment

For Environmental Engineers / Site Owners:

- Install containment systems for transformer oil, glycol, and firefighting runoff.
- Include oil-water separators, bunding, drainage, and leak detection sensors.
- \square Manage contamination risks across battery, coolant, and fire suppression systems.

🗘 Water Availability

For Fire Services / Local Authorities:

- Ensure site water supply meets firefighting requirements.
- Coordinate with local authorities to determine the form of water provision (e.g. hydrants, tanks, mains).

Fencing & Access Control

For Security Leads / Contractors:

- □ Secure sites using high-security fencing and controlled access systems.
- □ Include surveillance (CCTV), motion sensors, and tamper-resistant barriers.
- Tailor fencing design to local conditions and site type (e.g. hybrid, remote).

Mitigation Measures

Objective: Prepare for and reduce the impact of abnormal events or failures.

B Firefighting Coordination

For Fire Authorities / Emergency Planners:

- Provide site schematics and establish emergency response zones.
- Equip entry points with annunciator panels.
- Enable defensive strategies and cooling protocols as needed.

💐 🛛 Emissions (Gas / Smoke / Noise)

For Environmental Health Officers / Risk Assessors:

- □ Plan for emissions from batteries, plastics, coolant systems, and cabling.
- Define evacuation and containment actions in emergency response plans.
- □ Include acoustic impact assessments for compliance with local noise regulations.

Key Takeaways

True product safety in BESS systems requires an integrated approach

Design to prevent risk: Site location, spacing, and access must support safety and emergency response.

Contain hazards: Use secure fencing, spill control, and firewater management.

Minimise impact:

Plan for firefighting, emissions, and safe evacuation.