



GUIDE BATTERY STORAGE · 6 MIN.

## Annual fire protection inspection in a battery energy storage system — 10 inspection points for existing plant

This checklist guides you through the annual inspection of the passive fire protection measures in an existing battery energy storage system. Ten inspection points show what to check on barriers, penetration seals and documentation, and how to record findings so they can be traced.

### 1. Update the as-built documentation before the walkdown

Responsible: Operator, plant manager · Timing: Two weeks before the inspection

Retrieve the fire safety concept, the penetration seal drawing, the penetration seal register and the reports from the last inspection out of the plant documentation. Add every modification, module replacement and retrofit from the past year, including the small ones. Without a current as-built record you are inspecting against a drawing that no longer reflects reality. Also establish whether the cell chemistry, capacity or fill level has changed — if so, a reassessment of the concept is due, not merely a visual inspection.

### 2. Work through the open items from the previous inspection

Responsible: Plant manager · Timing: At the start of the inspection

Go through last year's defects list item by item and establish which defects have been rectified and by whom. For every repair to a classified penetration seal, require confirmation from the installing specialist contractor stating the date and the system used. Items not completed are carried over with a new deadline and escalated, not quietly rolled forward. A complete chain of evidence covering finding, rectification and confirmation is the core of the operator's documentation.

### 3. Check barrier surfaces for mechanical damage and deformation

Responsible: Competent inspector · Timing: Inspection walkdown

Visually inspect all accessible barrier surfaces for cracks, holes, impact damage, sagging and bulging areas. Pay particular attention to the heights at which pallet trucks or maintenance ladders are used — that is where most damage occurs. Tap-test sample areas to find loose or hollow-sounding sections. Document every finding with a photograph, the position from the penetration seal register and an assessment of whether the classification is still met.

## 4. Assess signs of moisture, corrosion and ageing

Responsible: Competent inspector · Timing: Inspection walkdown

In containers and outdoor installations, moisture is the most common cause of a loss of insulating performance. Look for water stains, efflorescence, rust streaks on the supporting structure and saturated insulation in the plinth area and beneath penetrations. Check whether condensate from the cooling system is dripping onto barrier surfaces. Soaked insulation layers and corroded fixings must be assessed and, as a rule, replaced rather than dried out.

## 5. Re-check joints, butt joints and perimeter connections

Responsible: Competent inspector · Timing: Inspection walkdown

Over the operating years, components move through temperature cycling and settlement, and that is exactly where joints open up. Check the butt joints of the barrier layers as well as the connections to floor, ceiling, wall and steelwork for cracks and gaps. Check whether sealants have become brittle, shrunk or detached. Repairs may only be made with the material specified in the proof of fitness for use — a cartridge from the builders' merchant voids the classification.

## 6. Reconcile every penetration against the penetration seal register

Responsible: Competent inspector · Timing: Inspection walkdown

Count the cable, pipe and duct penetrations you find and reconcile each one with the penetration seal register. Any penetration not recorded is a defect until evidence of proper re-sealing is provided. For existing penetration seals, check the fill level of cable trays and the minimum spacing to adjacent penetrations against the requirements of the approval; the test basis for penetration seals is EN 1366-3. Cables pulled in after the fact are by far the most common finding in existing installations.

## 7. Check fixings and supporting structure for secure seating

Responsible: Competent inspector · Timing: Inspection walkdown

Check on a sample basis whether screws, anchors and clips are still tight and whether fixing spacings are unchanged. Look for pulled-out fixing points, missing fasteners and sagging boards. In containers and on steel structures, additionally check whether vibration has loosened the fixings. Replace loosened fixings with the fastener named in the approval, not with the nearest thing on the tool trolley.

## 8. Check labelling, accessibility and clear space

Responsible: Competent inspector, plant manager · Timing: Inspection walkdown

Check that the labels on all classified penetration seals are still present, legible and visible from the intended side. Remove material stored in front of barriers or relief openings — parked pallets and spare parts are a recurring finding in plant rooms. Check whether the planned distances between units are still maintained and have not been obstructed by retrofitted equipment. Replace missing labels using the data from the penetration seal register.

## 9. Review the interfaces with gas venting, detection and suppression

Responsible: Competent inspector, specialist contractors for the respective trades · Timing: Inspection walkdown, coordinated with the maintenance dates

The passive thermal barrier only works in combination with the active systems. As part of your walkdown, check the physical interfaces: duct penetrations through classified components, relief openings, dampers and the penetrations of detection and suppression pipework. Align your dates with the maintenance of the fire detection, ventilation and suppression systems, so that findings can be assessed together. The maintenance records of the active systems belong in the same plant documentation.

## 10. Produce the inspection report, set deadlines and file the documentation

Responsible: Competent inspector, operator · Timing: Within two weeks of the inspection

Summarise all findings in a report with position, photograph, assessment, deadline and responsible person, distinguishing between safety-relevant and formal defects. Record which standards and approvals you relied on, so that the assessment remains traceable in the following year. File the report in the plant's fire protection documentation and update the penetration seal register. Schedule the next inspection and the re-check of the defect rectification at the same time.

## Frequently asked questions

### Must the inspection of passive fire protection measures take place annually?

There is no uniform statutory annual interval specifically for fire penetration seals — the intervals follow from the building permit, the fire safety concept, the state inspection ordinance, the property insurer's requirements and the risk assessment. DGUV Information 205-040 collates the recurring inspection intervals in fire protection and is a good starting point. In battery energy storage systems an annual cycle has become established, because retrofits and module replacements change a great deal here. Set your interval in writing and give the reasoning for it.

### Who is allowed to carry out the annual inspection?

For the visual inspection and reconciliation with the penetration seal register, a competent person who can read and assess the proofs of fitness for use is sufficient. Repairs to classified penetration seals may only be carried out by specialist contractors, who then confirm conformity with the approval. Where the inspection ordinance or the building permit calls for examination by a recognised expert, your own inspection does not replace that examination. Settle the allocation of roles once, as a matter of principle, and set it out in the operating manual.

### What should you do if the barrier is not accessible?

Record it explicitly in the report as an area that could not be inspected, rather than quietly skipping it — an uninspected area is not an inspected area. Agree whether the area will be opened up at the next planned shutdown, or whether you will make a substitute assessment using endoscopy and photographs from the construction phase. At the same time, check whether accessibility can be improved permanently, for example by adding an access opening. Over the life of the installation that pays for itself several times over.

### Let us talk about your project

Reply within 24 hours on working days.

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