

**JH Solar**

# **Cause analysis report of energy storage station fire**



## Overview

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The database compiles information about stationary battery energy storage system (BESS) failure incidents. There are two tables in this database: Stationary Energy Storage Failure Incidents – this table tracks utility-scale and commercial and industrial (C&I) failures. Other Storage Failure.

This report is a technical review of the fire event that occurred on the 20 th of September 2022 at the Elkhorn Battery Energy Storage System (BESS) located in Monterey County, California, as part of the Moss Landing Electric Substation. This report has been prepared for public use. This report.

The global installed capacity of utility-scale battery energy storage systems (BESS) has dramatically increased over the last five years. While recent fires afflicting some of these BESS have garnered significant media attention, the overall rate of incidents has sharply decreased,<sup>1</sup> as lessons learned.

This report provides an analysis of historical BESS fire incidents and their causes, a review of the types of contaminants released, the extent of environmental impacts, and how advancements in safety regulations and technology have mitigated risks. Modern standards and designs have significantly. What are stationary energy storage failure incidents?

Note that the Stationary Energy Storage Failure Incidents table tracks both utility-scale and C&I system failures. It is instructive to compare the number of failure incidents over time against the deployment of BESS. The graph to the right looks at the failure rate per cumulative deployed capacity, up to

12/31/2024.

What is the first publicly available analysis of battery energy storage system failures?

Claimed as the first publicly available analysis of battery energy storage system (BESS) failures, the work is largely based on EPRI's BESS Failure Incident Database and looks at the root causes of a number of events inputted to it.

What causes large-scale lithium-ion energy storage battery fires?

Conclusions Several large-scale lithium-ion energy storage battery fire incidents have involved explosions. The large explosion incidents, in which battery system enclosures are damaged, are due to the deflagration of accumulated flammable gases generated during cell thermal runaways within one or more modules.

What are the characteristics of fire and explosion of energy storage stations?

And the fire and explosion of energy storage stations have certain characteristics, mainly including: the types of accident batteries are mostly ternary lithium-ion batteries, and most of them occur during charging and rest periods.

What are the different types of energy storage failure incidents?

Stationary Energy Storage Failure Incidents - this table tracks utility-scale and commercial and industrial (C&I) failures. Other Storage Failure Incidents - this table tracks incidents that do not fit the criteria for the first table. This could include failures involving the manufacturing, transportation, storage, and recycling of energy storage.

Are there fires and explosions in lithium battery energy storage stations?

There have also been considerable reports of fires and explosions in lithium battery energy storage stations. According to incomplete statistics, there have been over 30 incidents of fire and explosion at energy storage plants worldwide in the past 10 years.

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### [Energy storage station fire report](#)

They analyzed the six loss scenarios caused by the fire and explosion of the energy storage power station and the unsafe control actions they constituted. These assist in preventing fires

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### Battery Fires in Focus: Dissecting the Moss Landing Incident

An in-depth look at the Moss Landing fire, its causes, impact, and how safer battery tech and standards can prevent future energy storage incidents.



### Elkhorn Battery Energy Storage System Fire of September ...

Preface This report is a technical review of the fire event that occurred on the 20 th of September 2022 at the Elkhorn Battery Energy Storage System (BESS) located in ...

### New report challenges concerns over BESS fire environmental ...

The environmental consequences of battery

energy storage system (BESS) fires have been a subject of increasing scrutiny, but one organization claims to have good news. ...



## Initial Findings Released From Inter-Agency Fire Safety

Governor Kathy Hochul today released initial findings from the Inter-Agency Fire Safety Working Group, which was convened following fires at battery energy storage ...

## Carnegie Road Energy Storage System Failure Response, ...

This report conveys the lessons learned from the Carnegie Road energy storage system (ESS) failure event, including aspects of emergency response, root cause investigation, and the ...



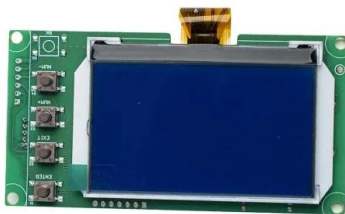
## Insights from EPRI s Battery Energy Storage Systems ...

Following the incident, multiple root cause investigation reports were released publicly, and safety became a priority issue for the energy storage industry in the US.

## Analysis of energy storage safety accidents in lithium-ion

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The independent reports of Fisher Engineering Inc (FEI) and ESRG also provided the same report on the cause of the accident, stating that the main cause of the accident was the thermal ...



## Investigation confirms cause of fire at Tesla's ...

A liquid coolant leak caused thermal runaway in battery cells, which started a fire at the 300MW/450MWh Victorian Big Battery in Australia last July. A technical report into findings of specialist ...

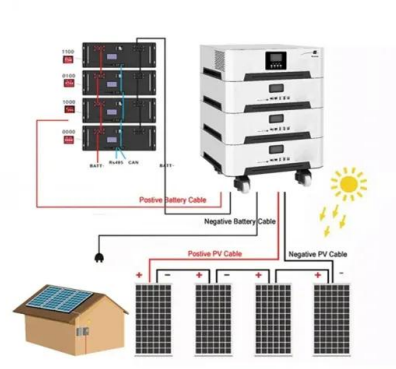


## Report: Four Firefighters Injured In Lithium-Ion Battery Energy Storage

FSRI releases new report investigating near-miss lithium-ion battery energy storage system explosion. Funded by the U.S. Department of Homeland Security (DHS) and ...

## Battery Energy Storage System Fire Safety: Key Risks

Battery energy storage systems are vital for the transition to clean energy, but they come with serious fire risks. As their use grows, consistent global standards for ...



## Firefighters Make Progress on Persistent Battery Energy Storage ...

Firefighters continued their efforts Sunday to put out a commercial structure fire that broke out four days ago at one of the largest battery and energy storage facilities in the ...

## Battery Storage Fire in California Sparks Widespread Safety ...

A nearly two-week-long fire at a battery energy storage facility in California highlighted the risks associated with emerging battery storage technologies that are central to ...



## Fire at Statera BESS project in England brought ...

Essex County Fire and Rescue Service said that on Wednesday (19 February), firefighters responded to a fire at the battery energy storage system (BESS) project in East Tilbury, Essex. With close ...

## Battery Storage Safety: Mitigating Risks and ...

This text is an abstract of the complete article originally published in Energy Storage News in February 2025. Fire incidents in battery energy storage systems (BESS) are rare but receive significant public and ...



## Bridging the fire protection gaps: Fire and explosion risks in grid

Introduction The challenges of providing effective fire and explosion hazard mitigation strategies for Battery Energy Storage Systems (BESS) are receiving appreciable ...

## Assessment of Potential Impacts of Fires at BESS Facilities

This report provides an analysis of historical BESS fire incidents and, their causes, a review of the types of contaminants released, the extent of environmental impacts, ...



## Battery Energy Storage Systems Explosion Hazards

INTRODUCTION Lithium ion battery energy storage systems (BESSs) are increasingly used in residential, commercial, industrial, and utility systems due to their high energy density, ...

## Site safety measures help limit spread of fire at 600 ...

The exact cause of the incident is unknown at this point. Fire officers will carry out an investigation with the site owners and equipment suppliers when it is safe to do so. Essex County Fire and Rescue Service ...



## Gateway Energy Camino Lithium-Ion Battery Fire

Gateway Energy Storage, LLC operates the facility as a Delaware-incorporated limited liability company. The company is considered a responsible party under the Comprehensive ...

## Fire burns for five days at huge lithium-ion energy storage facility

A fire at a California lithium-ion battery energy storage facility once described as the world's largest has burned for five days, prompting evacuation orders. The fire broke out on ...



## Lithium-ion energy storage battery explosion incidents

Utility-scale lithium-ion energy storage batteries are being installed at an accelerating rate in many parts of the world. Some of these batteries have experienced ...

## Accident analysis of Beijing Jimei Dahongmen 25 MWh DC

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Accident analysis of Beijing Jimei Dahongmen 25 MWh DC solar-storage-charging integrated station project Institute of energy storage and novel electric technology, China Electric Power ...



### [Energy Storage , ACP](#)

This report provides an analysis of historical BESS fire incidents and their causes, a review of the types of contaminants released, the extent of environmental impacts, and how advancements in safety regulations and ...

## Building a Safer Storage Industry After the Moss ...

A thorough root cause analysis (RCA) is paramount to understanding the Moss Landing incident and its broader implications for the rapidly growing battery energy storage industry.



## Statistical analysis of fire and explosion accidents in ...

Abstract Abstract: The wide application of lithium-ion batteries in electrochemical energy-storage stations (EESSs) has led to frequent fire and explosion accidents.

## After a High-Profile Fire, Battery Energy Storage Providers

A clean-energy trade group's report offers safety guidelines for battery energy storage systems following a fire at one of the largest battery storage plants.



### [BESS Failure Incident Database](#)

The published report Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database: Analysis of Failure Root Cause contains the methodology and results of this root cause analysis.

## Analysis of energy storage safety accidents in lithium-ion

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The official investigation report from the Victoria Energy Security Agency shows that the cause of the fire was initially determined to be a short circuit in two specific battery circuits at the same

...



## Fire burns for five days at huge lithium-ion energy ...

A fire at a California lithium-ion battery energy storage facility once described as the world's largest has burned for five days, prompting evacuation orders. The fire broke out on Wednesday at the ...

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