

PIENAAR ENERGY (PTY) LTD

Causes of failure of lithium batteries for ship energy storage



Overview

Li-ion batteries can fail due to mechanical, chemical, or thermal abuse. This failure can lead to a phenomenon known as "thermal runaway", where the heat generated becomes self-sustaining, causing temperatures to soar and triggering a dangerous chain reaction. Heavy weather and an improperly secured cargo of lithium-ion battery energy storage system (BESS) units led to two fires aboard the 410-foot (120-metre) cargo vessel Genius Star XI as it was transiting the North Pacific Ocean on Christmas Day 2023, causing US\$3. ammonia, hydrogen, LNG, methanol etc. A Growing Risk In 2023, Allianz Global Corporate & Specialty (AGCS) reported 200 fire incidents at sea, with 55. The results showed that an unsuitable firefighting system for putting out lithium battery fires, high humidity, and monitoring equipment without a real-time alarm function have the most significant influence on the occurrence of LBESS fire accidents during maritime transportation. The research work. These systems store enormous energy in confined spaces.

Causes of failure of lithium batteries for ship energy storage

Commercial and Industrial ESS

Air Cooling / Liquid Cooling

- Budget Friendly Solution
- Renewable Energy Integration
- Modular Design for Flexible Expansion



Fires at Sea: The Hidden Dangers of Lithium-Ion Batteries

Li-ion batteries can fail due to mechanical, chemical, or thermal abuse. This failure can lead to a phenomenon known as "thermal runaway", where the heat generated becomes self ...

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Fire Accident Risk Analysis of Lithium Battery Energy Storage ...

A lithium-ion battery energy storage system (LBESS) is usually composed of a low boiling point and a flammable organic electrolyte. High temperature, vibration, and other external ...



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Cause and Mitigation of Lithium-Ion Battery Failure--A Review

Lithium-ion batteries (LiBs) are seen as a viable option to meet the rising demand for energy storage. To meet this requirement, substantial research is being accomplished in battery materials as well as ...

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Improperly secured batteries caused fires aboard cargo ship

An improperly secured cargo of lithium-ion battery energy storage systems led to two fires aboard the cargo ship Genius Star XI while underway on Christmas Day 2023.



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Batteries & Energy Storage on Ships - Maritime Hub

Modern vessels carry: large lead-acid battery rooms lithium-ion ESS containers hybrid propulsion storage emergency and backup power banks These systems store enormous energy in ...

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Loose Batteries Nearly Cause Pacific Cargo Ship Disaster: NTSB Report

The National Transportation Safety Board (NTSB) investigation revealed that the vessel, carrying 192 battery energy storage system (BESS) units, faced severe weather with gusts ...



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Lithium-ion battery fires on vessels remain one of the biggest safety



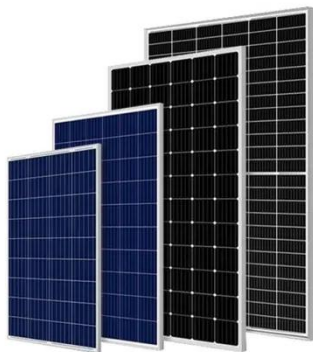
Allianz has highlighted that battery fires on vessels remain one of the biggest safety issues facing the shipping industry. There have been a number of serious fire incidents in recent years ...

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POTENTIAL DAMAGES & LIABILITIES ARISING FROM A ...

In cases where batteries are used as the sole propulsion mechanism for a vessel, a large energy storage system (ESS) will be constructed, made up of several batteries.

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Risk analysis for marine transport and power applications of lithium

The causal factors of these accidents are mainly mechanical, electrical and thermal abuse. To better understand the failure mechanism and thermal runaway (TR) consequences of LIBs, this ...

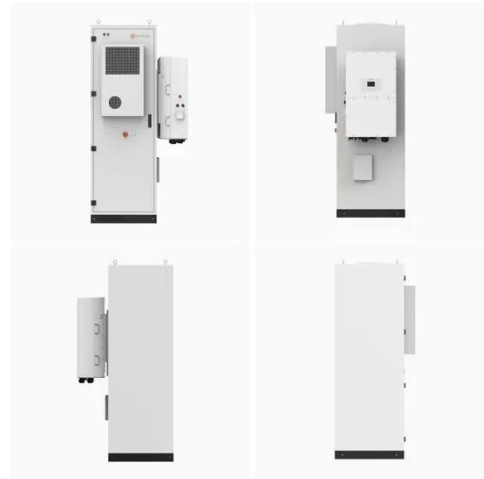
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Dangers of lithium-ion batteries on vessels

Ocean shippers face numerous

challenges when transporting lithium-ion batteries, primarily due to the batteries' fire risks and the complexities of maritime logistics. Ensuring that batteries are properly ...

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