

Explosion-proof standards for power cabinets in solar container communication stations





Overview

How do I design an explosion prevention system for an ESS?

The critical challenge in designing an explosion prevention system for a ESS is to quantify the source term that can describe the release of battery gas during a thermal runaway event.

Does NFPA 855 require explosion control?

NFPA 855 [*footnote 1], the Standard for the Installation of Stationary Energy Storage Systems, calls for explosion control in the form of either explosion prevention in accordance with NFPA 69 [*footnote 2] or deflagration venting in accordance with NFPA 68 [*footnote 3].

Can a flammable battery gas source be used for explosion control?

NFPA 855 recommends that a UL 9540A (ANSI/CAN/UL, 2019) test be used to evaluate the fire characteristics of an ESS undergoing thermal runaway for explosion control safety systems. An approach to determine a flammable battery gas source term to design explosion control systems has been developed based on UL 9540A or similar test data.

What is the global concentration of battery gas inside a failing half stack cabinet?

The global concentration of the battery gas inside the failing half stack cabinet is above the 25% LFL limit for less than 1 min before the explosion prevention system is activated for both failure scenarios. The battery gas global concentration drops to 8% LFL during the steady operation of the explosion prevention system.



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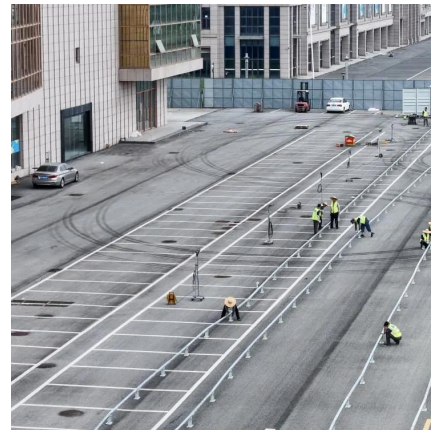
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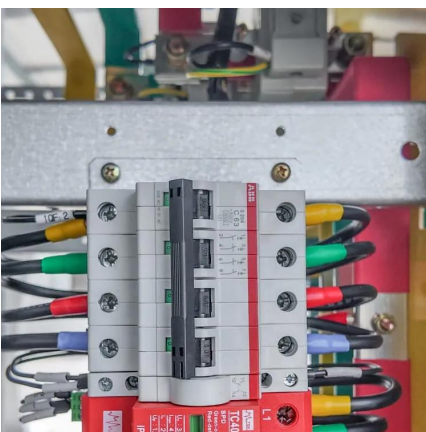
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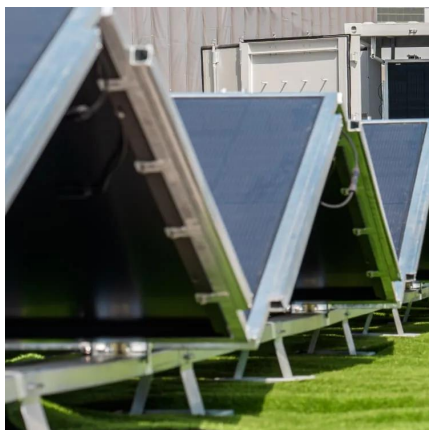


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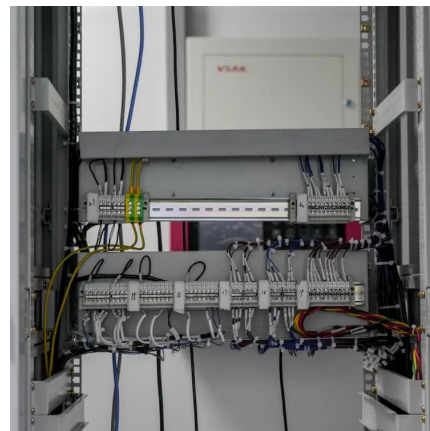


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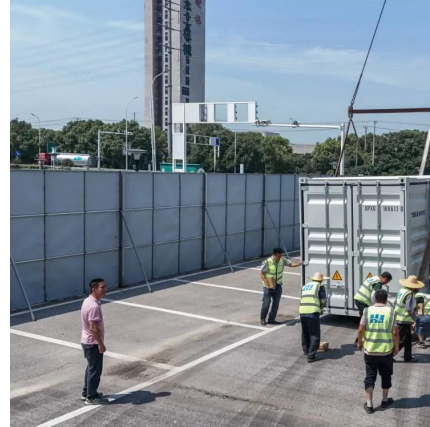
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