APSENSING.

Fire Detection for Rooftop, Greenfield and Floating Solar Panels

Thailand

Project Overview

Solar energy is playing an increasingly vital role in the transition to clean and renewable energy sources worldwide, driven by its growing affordability and accessibility. However, safety concerns such as overheating solar panels, defective cables, and faulty connectors can pose serious risks to industrial sites and the surrounding environment and infrastructure.

Rooftop fires present a unique challenge for emergency responders, as smoke may be drawn into the building's HVAC system, distributing it throughout the facility. This complicates fire detection, as multiple alarms may be triggered, delaying the identification of the fire's origin while the situation escalates. For solar panels installed in greenfield areas, electrical fires pose additional risks, as they can lead to large-scale surface fires, threatening nearby wildlife, disrupting critical roads or railway lines, and endangering surrounding villages. Floating solar installations on water bodies, such as ponds or reservoirs, also have unique hazards, as electrical fires can increase the risk of electrocution due to the conductive nature of water. Furthermore, a fire could result in the release of toxic substances into the water, harming aquatic life and potentially contaminating local water supplies. Prompt and effective fire mitigation strategies are crucial to managing these potential hazards and ensuring safety.

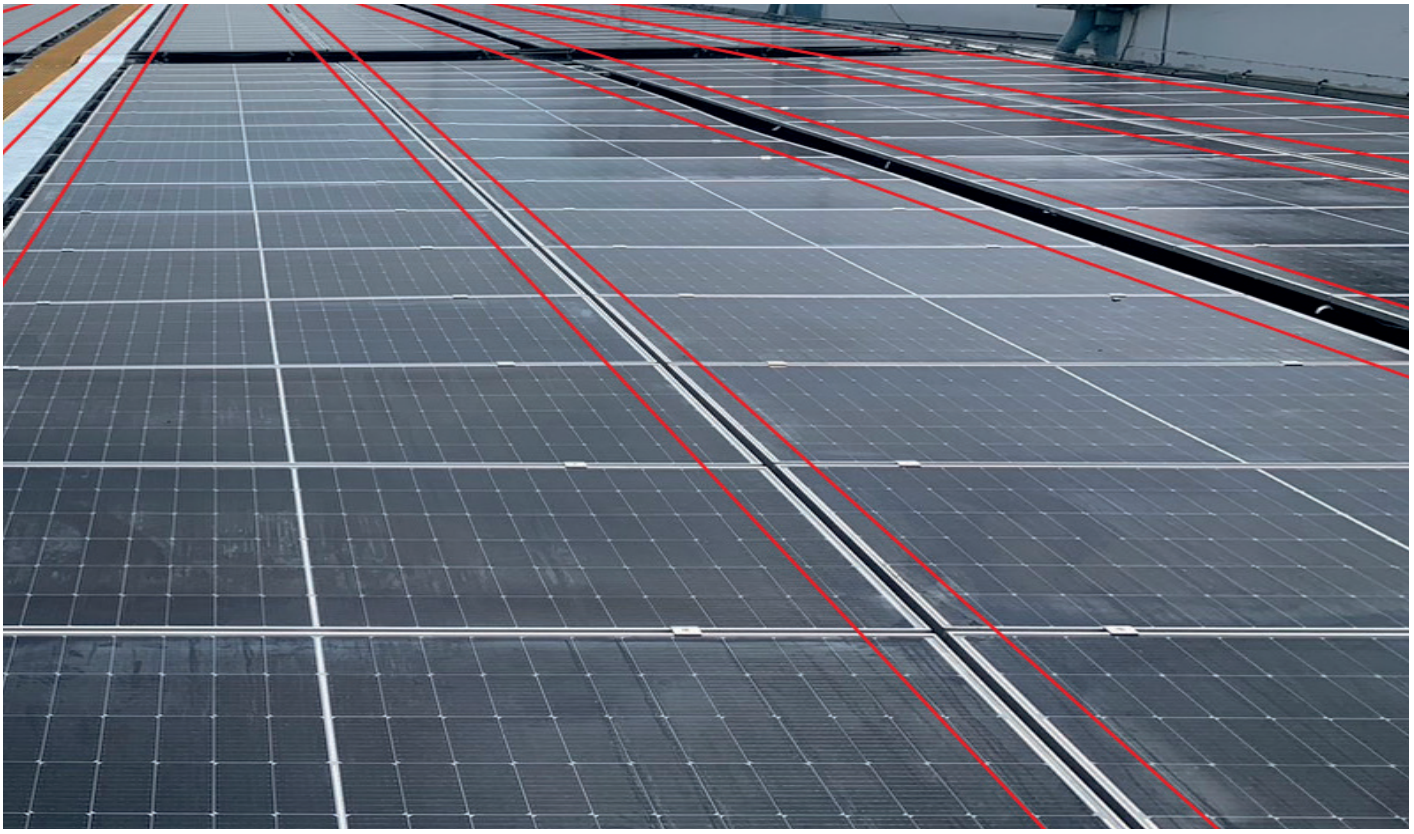
To proactively address these risks, a global player in food and beverage manufacturing sought a reliable

Background

- A global player in food and beverage manufacturing required a thermal monitoring solution for their solar panle installations on rooftops, a greenfield, and floating on water
- Overheating, electrical faults, or defective panels can cause serious consequences the buildings, the environment, and the surrounding infrastructure

Solution & Benefits

- Five N4387B fiber optic Linear Heat Detection (fiber optic LHD) systems, featuring dual-ended, 2-channel configuration
- 24/7 monitoring for hotspots and fires, ensuring rapid detecion and precise localization
- Seamless coverage of all solar panels and cable routing paths along mounting trays



Cables running underneath solar panels, highlighted in red for visibility.

fire detection and monitoring solution to protect five of their locations in Thailand, which include PV installations on rooftops, a greenfield site, as well as a floating PV installation.

Challenges

Solar PV installations, whether on rooftops, greenfields, or floating on water, present unique fire detection challenges, particularly in large-scale projects where cabling distance and precise monitoring are critical.

Our customer needed a solution to cover extensive areas (with up to 6 km sensor cable length) providing exact alarm location feedback. Formerly installed systems, such as conventional short range LHD, lacked the necessary detection accuracy and incurred higher installation costs when scaled for long-distance coverage.

Solution

We provided our customer with the N4387B fiber optic Linear Heat Detection (fiber optic LHD) system, featuring a dual-ended, 2-channel configuration that ensures comprehensive coverage for each site. The sites require individually tailored setups, protecting panels and cable trays with fiber optic sensor cable that range from 1 km to 6 km length, allowing for precise, real-time data collection, temperature monitoring and fire detection.

Benefits

The fiber optic LHD system offers several advantages:

- High detection precision: Unlike traditional systems, our fiber optic LHD technology offers precise location tracking of fire events, ensuring accurate alarm positioning while reducing response time and nuisance alarms.
- Robust and scalable: Our system is designed to withstand harsh outdoor conditions, making it ideal for solar PV installations across a diverse range of environments. It can be expanded and integrated into future monitoring systems, allowing for seamless upgrades.
- Seamless integration: The system interfaces directly with the existing fire alarm panels via relay

Greenfield solar installation with AP Sensing's fiber optic LHD system, shown in red for visibility, running underneath the panels.

connections, providing a straightforward and reliable integration without the need for additional hardware.

Implementation & Results

During the installation phase, our local partner in Thailand provided on-site support and training for the customer's engineering team. Our partner prepared language-specific training materials to facilitate clear communication and understanding among the operators. They also conducted field tests using a heat gun to simulate fire events, validating the system's performance. The results showcased excellent fire detection capabilities.

Conclusion

The implementation of the fiber optic Liner Heat Detection (fiber optic LHD) system for a major, globally operating food and beverage manufacturer in Thailand effectively addresses the unique challenges of fire detection in large-scale solar panel PV installations.

Our advanced linear heat detection technologies are highly adaptable and can be customized to meet the specific needs of each site - whether it's covering vast greenfield areas, manoeuvring complex rooftop cabling, or ensuring safety on floating platforms. By providing precise location tracking and real-time data collection, the solution delivers continuous, reliable monitoring at all five sites.

This project highlights the flexibility and effectiveness of our technology in tackling diverse fire detection challenges, no matter how complex. The successful implementation of the fire detection system across these five sites has reinforced the customer's trust in our solution. As a result, we have been selected to support additional sites in Thailand.

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