

CASE STUDY 5

UAS INFRASTRUCTURE INSPECTIONS



THE CHALLENGE

To provide cost and time-effective inspection solutions for the solar power sector.

With a growing global focus on electricity consumption, solar energy is set to be the power provider of the future.

The infrastructure of solar-based electricity generation plants requires the deployment of large-scale components. These components in turn, require continuous monitoring in order to ensure maximum levels of continued productivity whilst reducing production costs and increasing efficiency.

However, visually inspecting the infrastructure can be a manpower-intensive, time consuming and ultimately expensive exercise.



THE SOLUTION

Using UAS-based solutions to facilitate remote inspection.

Using solar panel cells, Exponent's UAS based solution allows for remote and rapid infrastructure inspection, eliminating the need for large teams of inspectors and almost making the physical inspection of solar panels redundant.

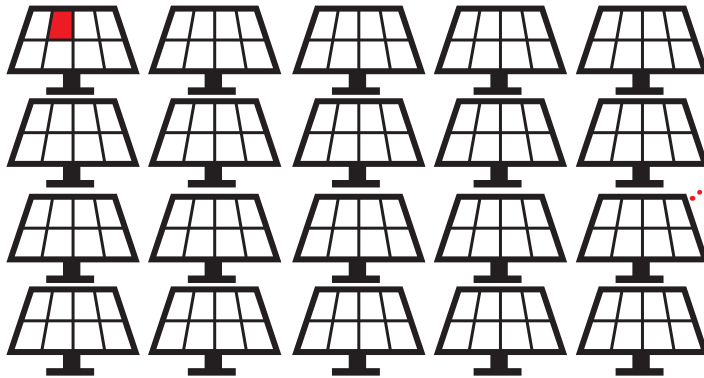
The IR payload further enables accurate identification of failed cells within a panel and also allows plant maintenance staff to concentrate their efforts on issue rectification rather than issue identification.

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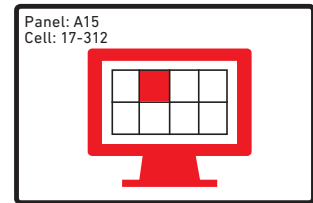
Defective Cell Detection via Thermography

Defective Cell



Spray Cleaning

UAS Control Center Video Screens



IMMEDIATE IMPROVEMENTS

- Prompt identification of failed/faulty solar panel components.
- Accurate determination of possible failure modes.
- Improved response time on solution determination.
- Reduction in manpower requirements

- for infrastructure maintenance.
- Greater infrastructure 'up-time', leading to increased power generation and lower per-unit costs.
- Long-term cost benefit due to increased operational efficiency.

THE TECHNOLOGY

UAS FUNCTIONALITY

UTILITY SPECIFICATIONS

The use of UAS technology like the multi-rotor with cold-swappable payloads.

SCOPE

EXTENDED RANGE

'Fixed Base' and 'Mobile Command Vehicle' options can be for selected for extended range/area deployments.

CLARITY

OPTIONAL ENHANCEMENTS TO SUIT CONDITIONS

Built-in 18x HD Zoom and infrared capabilities for Pan, Tilt and Gimbal options.

TRACKING

MANAGED CENTRALLY

Facilitated post flight image analysis and fault rectification capability.