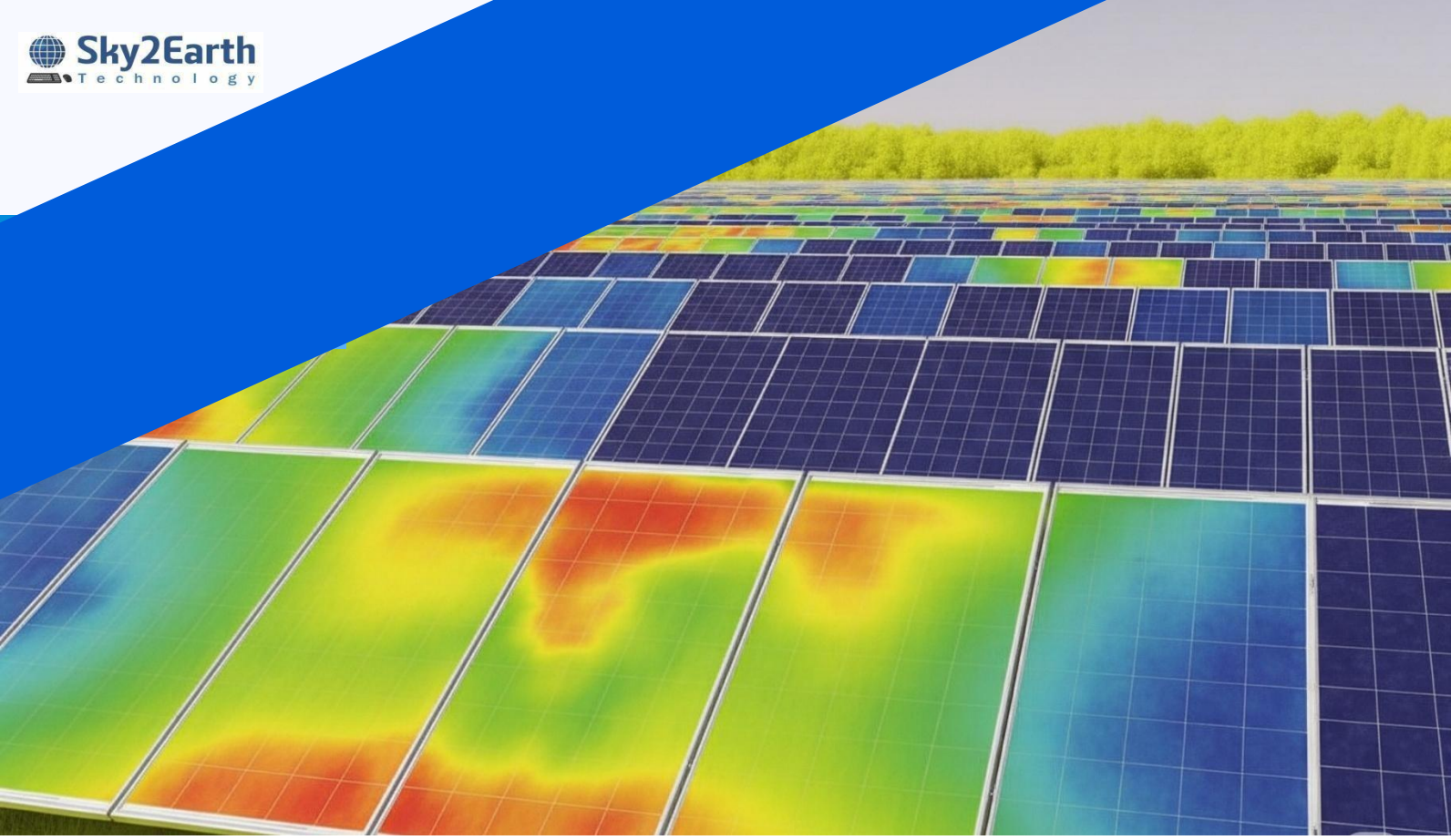
Sky2Earth Technology

Executive Report of Drone Thermography 45MW at XXXX Project, District, State

Contact:
Mobile: 8488894008
Email: connect@sky2earth.in



About Us

Sky2Earth Technologies specializes in end-to-end thermal inspection and survey services, along with the development of cloud-based software tools to streamline drone thermography operations. Our primary focus is on energy infrastructure, with a strong emphasis on solar plants and transmission lines.

Vision

Sky2Earth Technologies aims to be the leading end-to-end provider of drone inspection services and cloud-based management tools for the energy sector. From surveys and work-in-progress monitoring to thermal inspections, we help optimize operations, enhance efficiency, and support sustainable growth.

Mission

Our mission is to Delivering accurate, reliable, and repeatable aerial data to build cost-efficient ecosystems and future-ready assets.

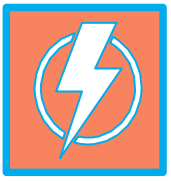
OBJECTIVE OF IR INSPECTION

- The primary **objective of this IR/Thermal inspection is to find anomalies** which indicate specific types of defects of various components of a Solar PV Module, the cause of such types of defects to avoid further damage & ensure normal functioning of modules.

- **AI-powered drone inspections** of solar panels enable fast and cost-effective early detection of potential power losses and safety risks, helping to minimize operational downtime and protect your asset value.

- We also offer a **cloud-based platform** for secure storage and easy access to all inspection data. Our services help reduce operations and maintenance (O&M) costs by enabling more targeted, efficient on-ground inspections — particularly useful for tasks like **Technical Due Diligence**, where focus on key findings is essential.

SCOPE OF INSPECTION & METHODOLOGY



SCOPE

The scope of this project entails a non-contact infrared thermal inspection performed with the thermal sensor mounted on a UAV inspect thermal & visible anomalies on solar PV panels.

METHODOLOGY

This power plant was divided into Multiple geographical blocks and each block is converted as a part of report.

DATA COLLECTION

The Block was covered in multiple flights using thermal sensor mounted on a UAV – the flight path was optimized to enable the creation of thermal Orthomosaic layer. The data collection process is explained in the following steps:

- The flight mission was designed for the specific layouts using compatible map files that contain the plants GPS boundaries.
- Image resolution & overlapped were specific at the time of mission planning. Less than 5cm Pixels is the GSD resolution. The degree of overlap between consecutive images is specified using frontal overlap & side overlap parameters. The values of these parameters are 80% & 80% respectively for thermal.
- Upon the receiving the confirmation that the environmental conditions were within satisfactory levels the scan was carried out. Some key parameters that were considered were irradiance, wind speed, cloud cover and tome of the day. The parameters thresholds were considered as the prescribed by the IEC TS62446-3:2017.
- The UAV then embarked on a near autonomous flight with minimal inputs from the pilots.

FAULT CATEGORY

Fault category will help you decide your next actions steps based on severity and impact of findings.

REMEDIATION RECOMMENDED FAULTS

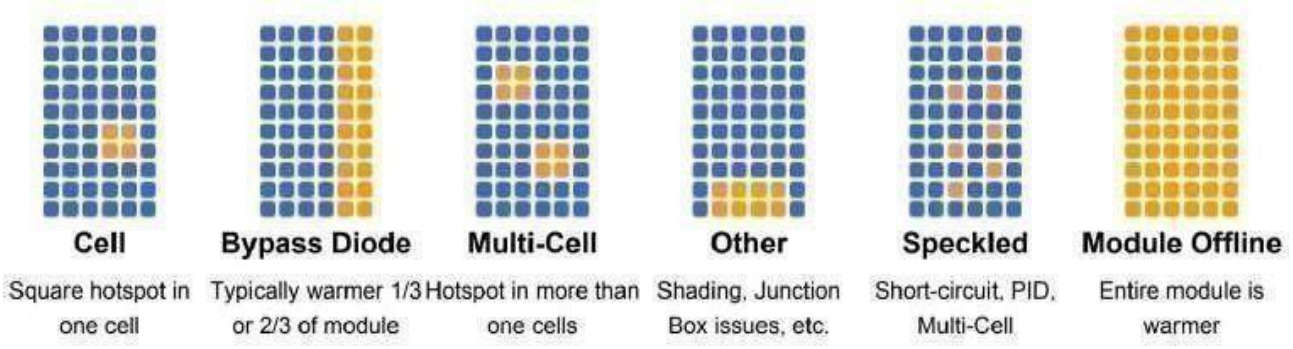
Modules with a high probability of causing system energy loss. The choice to remediate modules depends on anomaly density, replacement costs and replacement availability.

MONITOR & REMEDIATE FAULTS

Modules that pose a significant known energy loss or potential safety hazard on the site which require prioritized attention to recover energy loss and improve site safety

LONG-TERM MONITORING FAULTS

These modules have a low probability of causing extensive energy loss. Theses anomalies are unlikely to require remediation immediately but tracking the progression of anomalies over time is recommended.

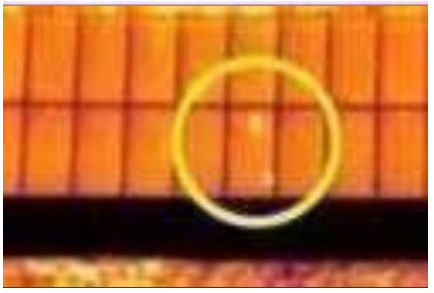


EXAMPLE OF ANOMALIES

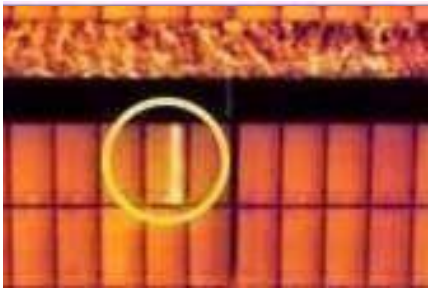
Below are visual examples of anomalies

Cell Hotspot

Multi Cell Hotspot

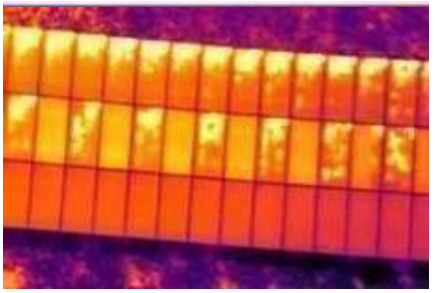


Bypass Diode

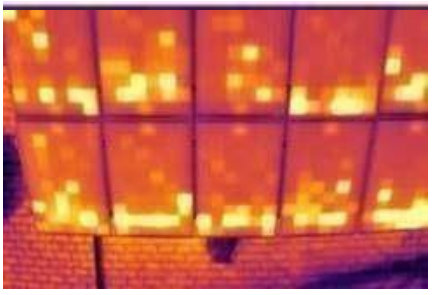


Power Mismatch

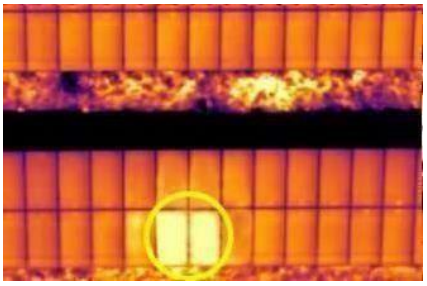
Speckled



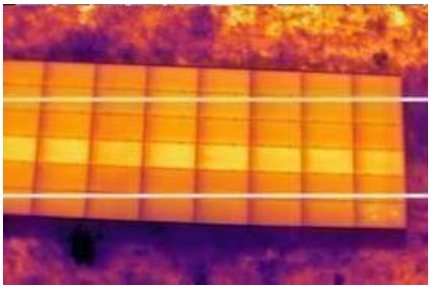
PID



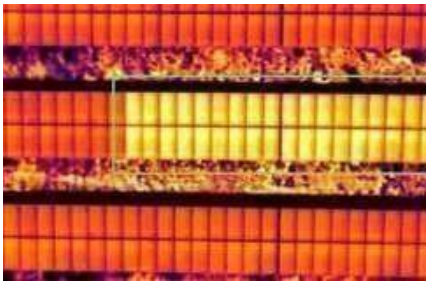
Module Offline



Partial String Offline



String Offline



1. Site Overview

1.1 Company Details

Company Name	xxxx
Address	xxxx

1.2 Site Summery

Project Name	xxxx
Project Location	Village, Taluka, District, State
Total MW	xxxx
Coordinates	76.222, 65.5455
Type of Modules	xxxx
Tilt Angle	xxxx
Total Module Installed	xxxx
Total Area	xxxx

1.3 Weather Details

Temperature	42.8 ℃
Wind Speed	8.5 km/h
Irradiation during fly	630 to 1900
Cloud Cover	Sunny

1.4 Sensor Details

Sensor Type	IR (Thermal)
Sensor Resolution	640 x 512
Frame Rate	30 Hz
Lense Model	40mm

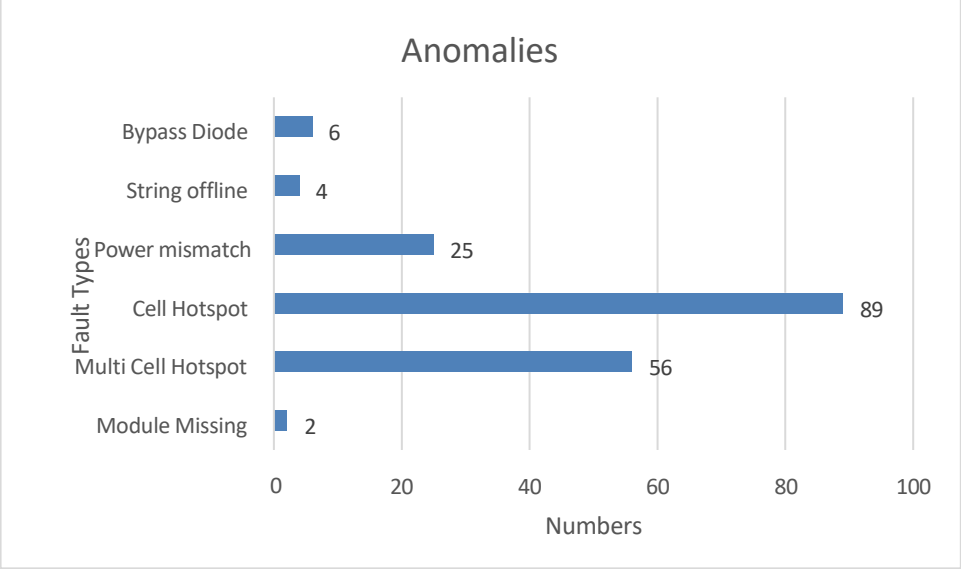
1.5 Data capture

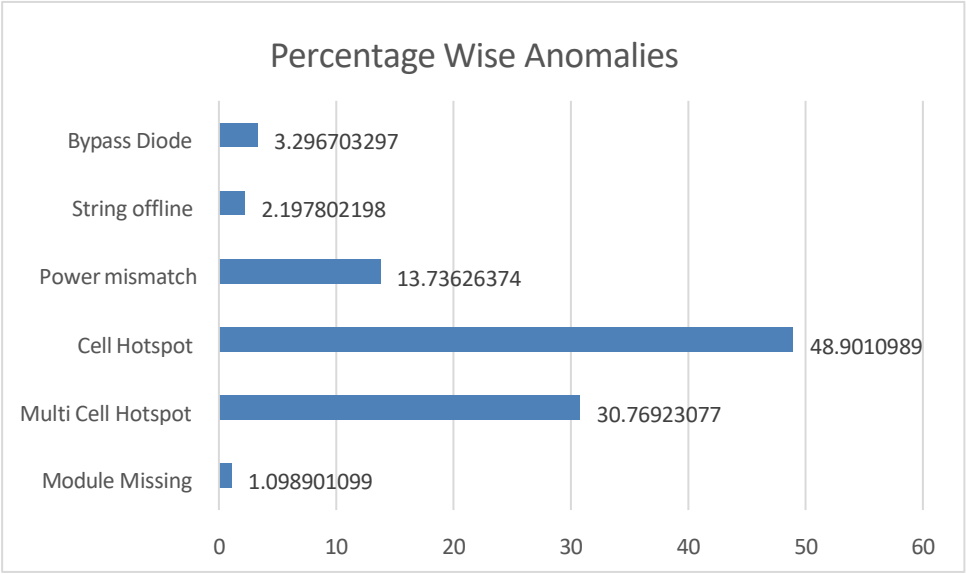
GSD	< 5cm
Fly Height	30mtr
Front Overlap	80%
Side Overlap	80%

2. RESULTS & ANALYSIS

QUICKSUMMARY

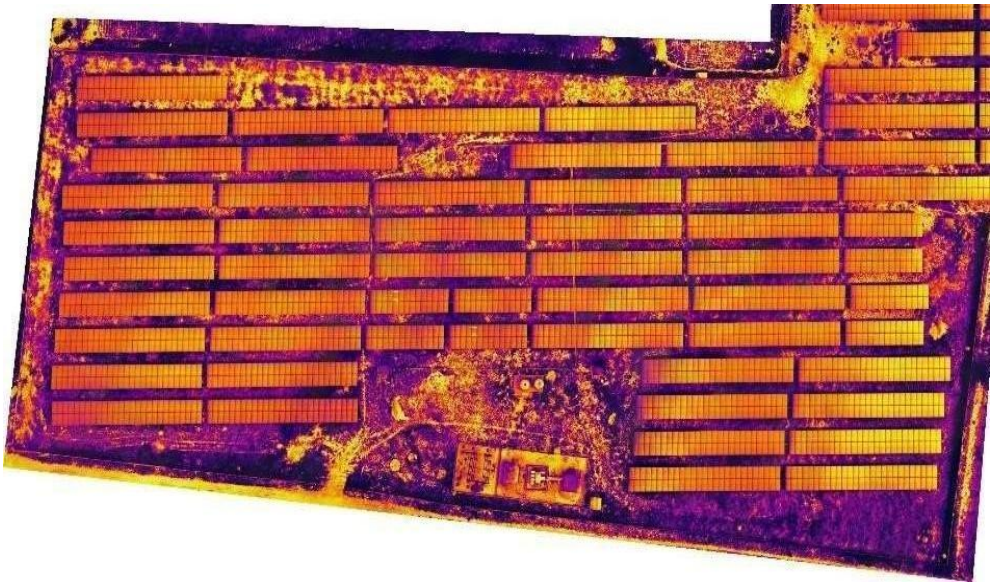
Sr. No	Anomalies Type	Numbers	Percentage
1	Module Missing	2	1.098901099
2	Multi Cell Hotspot	56	30.76923077
3	Cell Hotspot	89	48.9010989
4	Power Mismatch	25	13.73626374
5	String offline	4	2.197802198
6	Bypass Doide	6	3.296703297
Total Anomalies		**182**	**100**





Top View of Site-RGB

Top View of Site-Thermal



Visualize on SaaS Platform: data (Visual and Anomalies) can access to visualize at our cloud platform.

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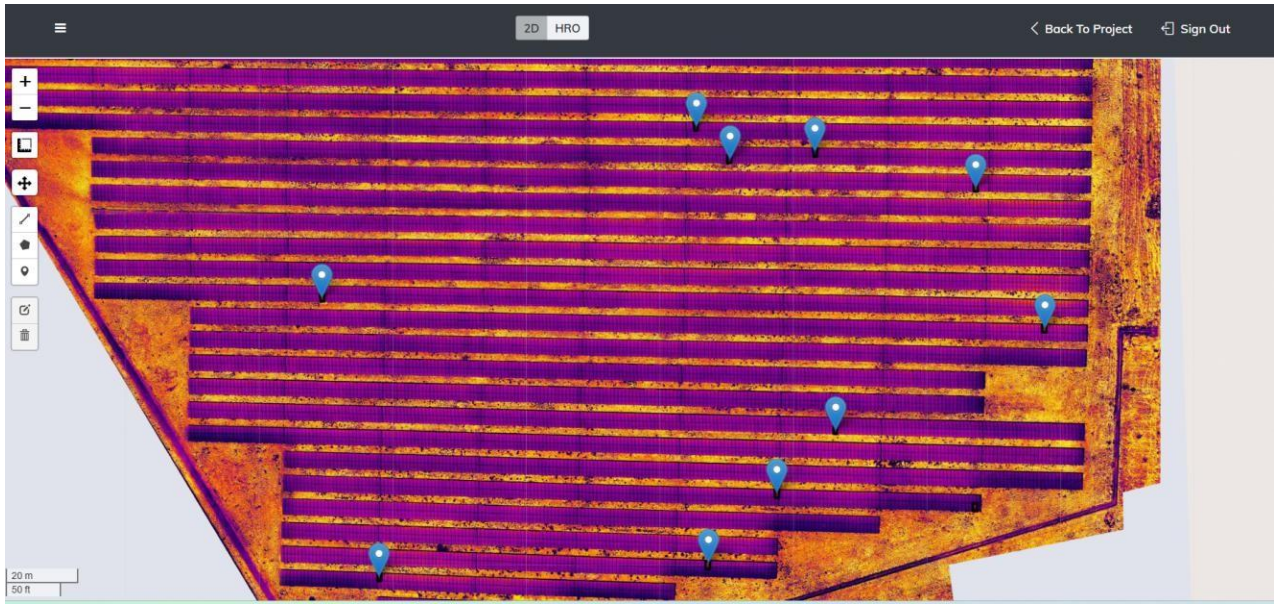
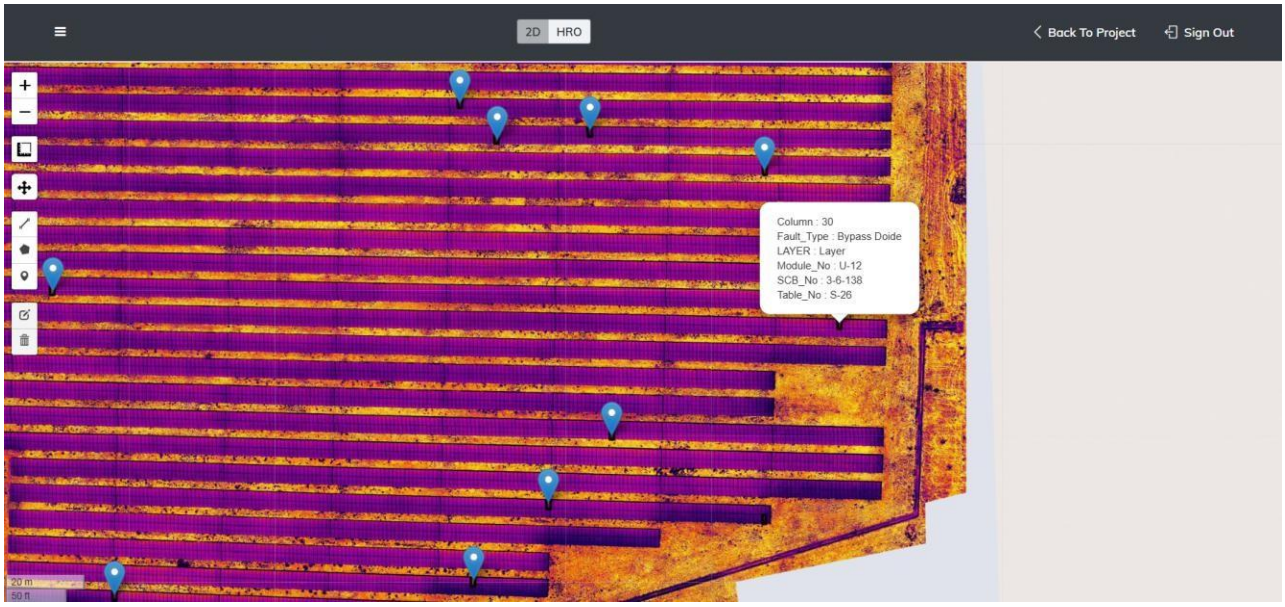
Annexure Annotation

Block 1 - Locations of Anomalies





Visualize on SaaS Platform: data (Thermal Visual and Anomalies) can access to visualize at our cloud platform.

Type	Count
Multi cell Hotspots	13
PID	3

Annexure Issues

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Severity overview

#	Severity	Components	Issues	Comments
1	5	Stíing	Otheí Issue	PID
2	5	Stíing	Otheí Issue	PID
3	3	Cell	Hot Spot	Multi Cell Hotspot
4	3	Cell	Otheí Issue	PID
5	5	Cell	Hot Spot	Multi Cell Hotspot
6	4	Cell	Hot Spot	Multi Cell Hotspot
7	3	Cell	Hot Spot	Multi Cell Hotspot
8	4	Cell	Hot Spot	Multi Cell Hotspot
9	4	Cell	Hot Spot	Multi Cell Hotspot
10	3	Cell	Hot Spot	Multi Cell Hotspot
11	3	Cell	Hot Spot	Multi Cell Hotspot
12	3	Cell	Hot Spot	Multi Cell Hotspot
13	3	Cell	Hot Spot	Multi Cell Hotspot
14	4	Cell	Hot Spot	Multi Cell Hotspot
15	4	Cell	Hot Spot	Multi Cell Hotspot
16	3	Cell	Hot Spot	Multi Cell Hotspot

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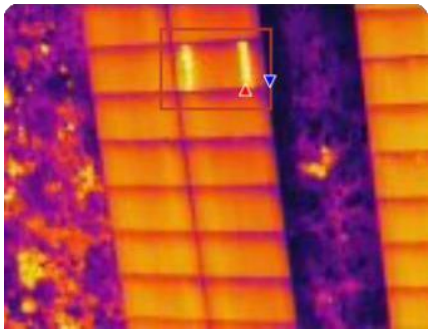
17.9490115, 76.5684567

 # 1 Seveiity 5 | Otheí Issue | Stiing



Thermal Readings:

~Avg : 36.843° Δ : 17.9° ▲ : 49.6°

▼ : 31.7°

Mukesh Bind

PID

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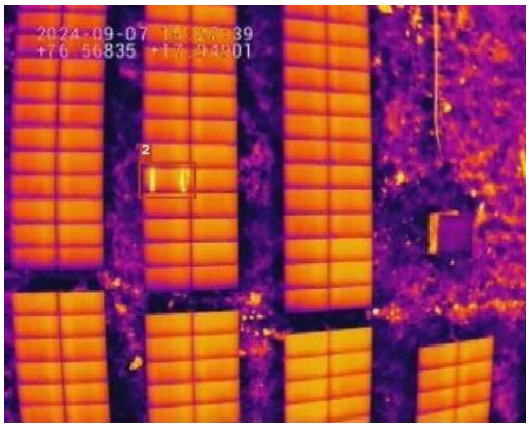

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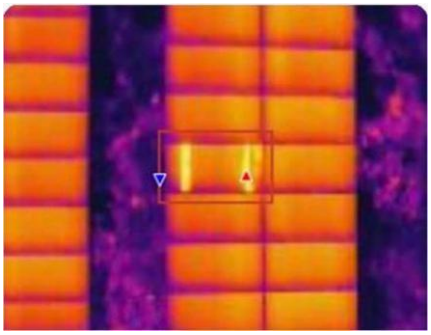
17.9490077, 76.5683487

 # 2 Seveiity 5 | Othei Issue | Stiing



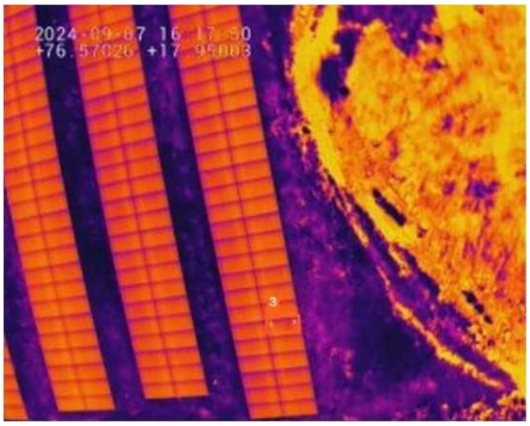
Thermal Readings:

~Avg : 34.852° Δ : 15.1° : 45.7°

: 30.6°

Mukesh Bind

PID



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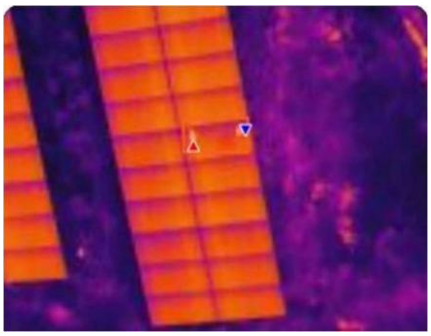
17.9500348, 76.5702636

 # 3 Seveiity 3 | Hot Spot | Cell



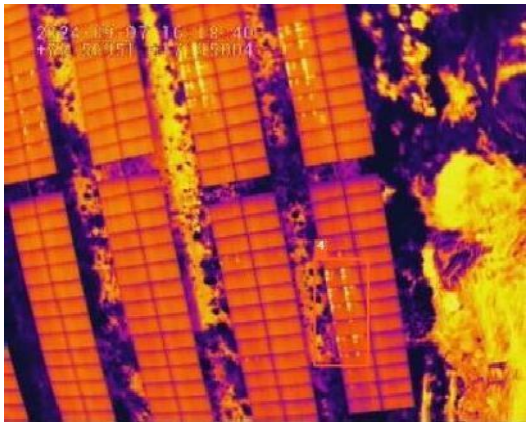
Thermal Readings:

~Avg : 37.316° Δ : 6.7° : 42.4°

: 35.7°

Mukesh Bind

Multi Cell Hotspot



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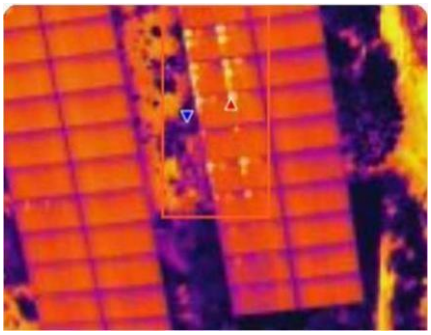
17.9500352, 76.5695085

 # 4 Seveiity 3 | Otheí Issue | Cell



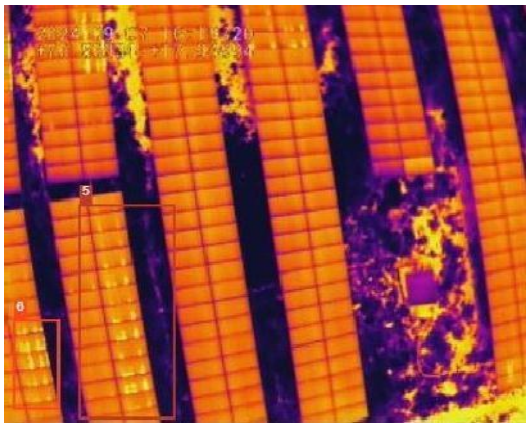
Thermal Readings:

~Avg : 36.27° Δ : 11.5° : 43.1°

: 31.6°

Mukesh Bind

PID



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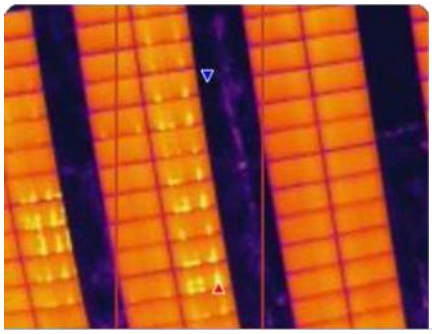
17.9499397, 76.5693437

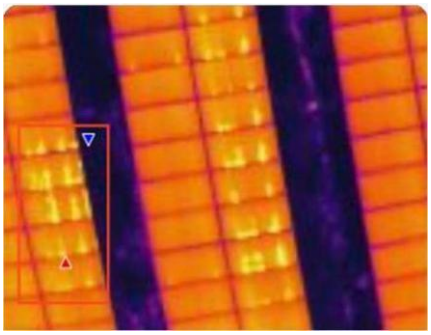
5 Seveiity 5 Hot Spot Cell



Thermal Readings:
~Avg : 34.936° Δ : 14.7° : 45.7°
: 31°

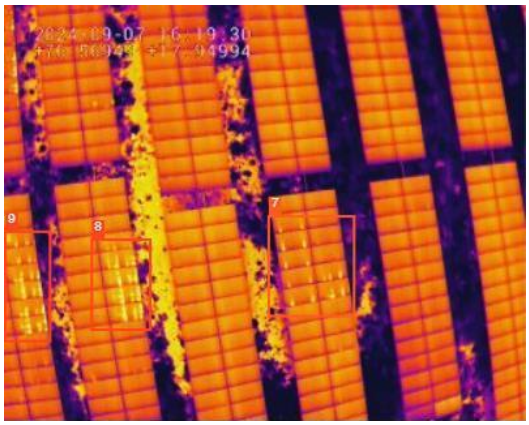
Mukesh Bind
Multi Cell Hotspot

6 Seveiity 4 Hot Spot Cell



Thermal Readings:
~Avg : 35.852° Δ : 11.9° : 43.5°
: 31.6°

Mukesh Bind
Multi Cell Hotspot



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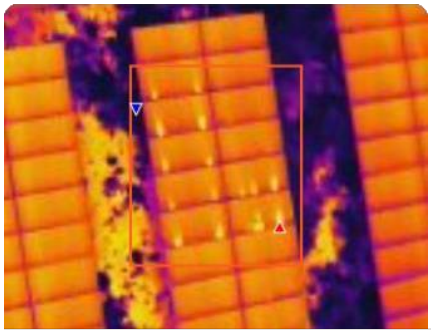
17.9499396, 76.5694929

7 Seveiity 3 Hot Spot Cell



Thermal Readings:

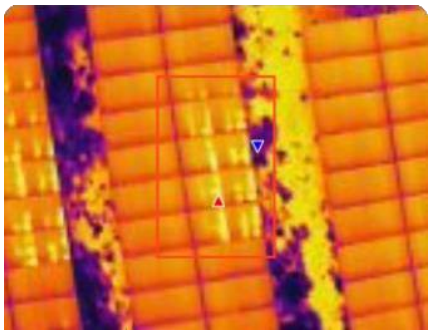
~Avg : 34.963° Δ : 10.8° ▲ : 41°

▼ : 30.2°

Mukesh Bind

Multi Cell

8 Seveiity 4 Hot Spot Cell



Thermal Readings:

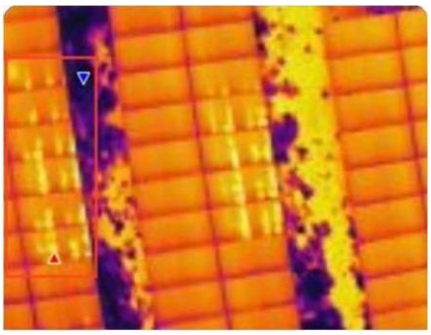
~Avg : 35.969° Δ : 14° ▲ : 45.9°

▼ : 31.9°

Mukesh Bind

Multi Cell Hotspot

9 Seveiity 4 Hot Spot Cell



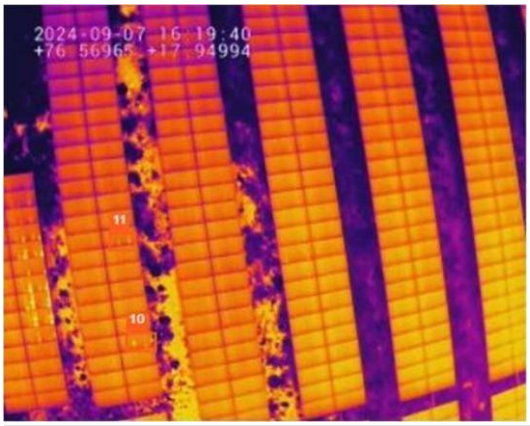
Thermal Readings:

~Avg : 35.188° Δ : 12° ▲ : 42.5°

▼ : 30.5°

Mukesh Bind

Multi Cell Hotspot



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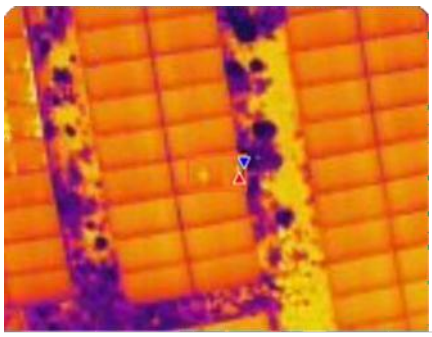
17.9499398, 76.5696451

 # 10 Seveiity 3 | Hot Spot | Cell



Thermal Readings:

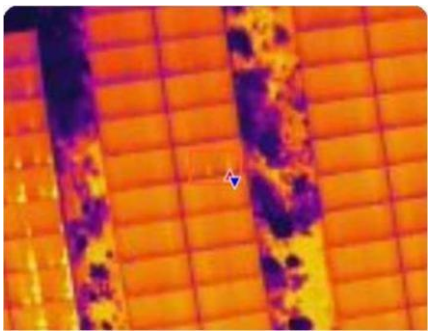
~Avg : 34.287° Δ : 8.2° ▲ : 37.6°

▼ : 29.4°

Mukesh Bind

Multi Cell Hotspot

 # 11 Seveiity 3 | Hot Spot | Cell



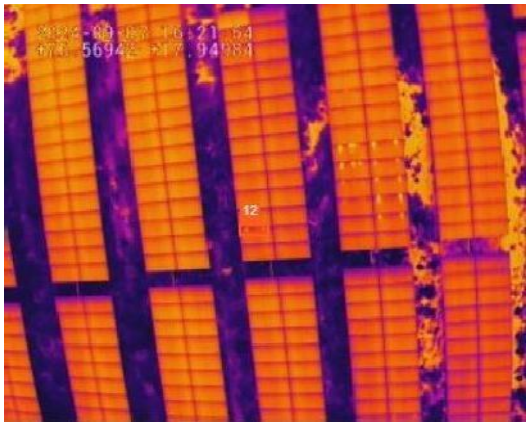
Thermal Readings:

~Avg : 34.379° Δ : 2.9° ▲ : 35.7°

▼ : 32.8°

Mukesh Bind

Multi Cell Hotspot



DJI_0016_T.JPG

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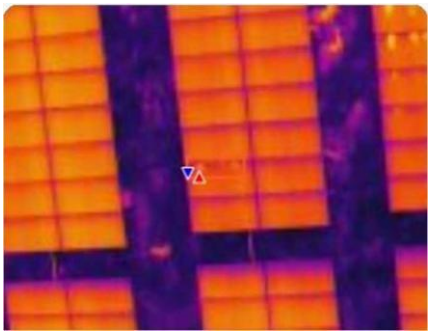
17.9498437, 76.5694241

 # 12 Seveiity 3 | Hot Spot | Cell



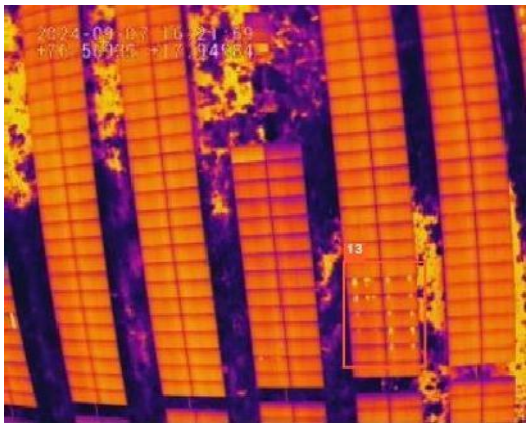
Thermal Readings:

~Avg : 36.485° Δ : 3.2° ▲ : 37.9°

▼ : 34.7°

Mukesh Bind

Multi Cell Hotspot



DJI_0018_T.JPG

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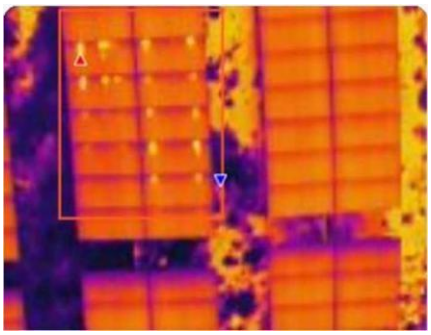
17.9498433, 76.5693482

 # 13 Seveiity 3 | Hot Spot | Cell



Thermal Readings:

~Avg : 36.104° Δ : 10.1° : 42.2°

: 32.1°

Mukesh Bind

Multi Cell Hotspo