

Public Works



Unmanned Aerial Systems

Greg Cutler

- 22 years with Mansfield Fire Rescue
- Emergency Manager for the city handling disaster management
- Established Mansfield UAS aviation program 2.5 years ago
- Established PSURT – Public Safety UAS Response Team
A regional UAS response team

Topics

- How do I start an FAA approved UAS program?
 - COA or Part 107
- What can I use an aircraft to do?
 - Inspections
 - Thermography
 - Deliveries
 - Mapping
 - LIDAR
 - Photogrammetry
- What types of aircraft exist and what should we use?
 - DJI
 - Others?

Which type program do I start?

Part 107

- Part 107 certification requires an individual working in a commercial or for profit environment to take a written FAA pilots test covering a number of different topics.

According to the FAA this would apply to those departments within a city organization that would use the aircraft to bring business to the city.

- Economic Development Department
- Public Relations/Media Department

It would not apply to Public Works personnel repairing or building infrastructure.

COA – Certificate of Authority

It is intended that government agencies operate under a COA.

Must submit form verifying jurisdictional authority and request access to COA system.

Blanket COA

Fill out documentation in COA system and apply for Blanket COA.

Blanket COA allows flights in Class G airspace only

Requires development of a training program and training field

Certify your pilots

Stipulates all rules your program must follow

Standard COA

Fill out documentation in COA system and apply for Standard COA

Restricts flights to whatever boundaries you establish

Allows for flights in class C, D airspace

Allows for waiver to fly in Class B airspace

May request other types of waivers, night flights

Requires that you have a training program and documentation



DALLAS-FORT WORTH CLASS B AIRSPACE

EXAMPLES OF CLASS B ALTITUDES

7000 MSL (110/30)
6500 MSL (110/25)
6000 MSL (110/20)
5500 MSL (110/15)
5000 MSL (110/10)
4500 MSL (110/5)
4000 MSL (110/0)

110
SFC

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25

110
20

110
15

110
10

110
5

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What Can I Use an Aircraft to do?

THERMOGRAPHY

Used to conduct Thermographic Inspections

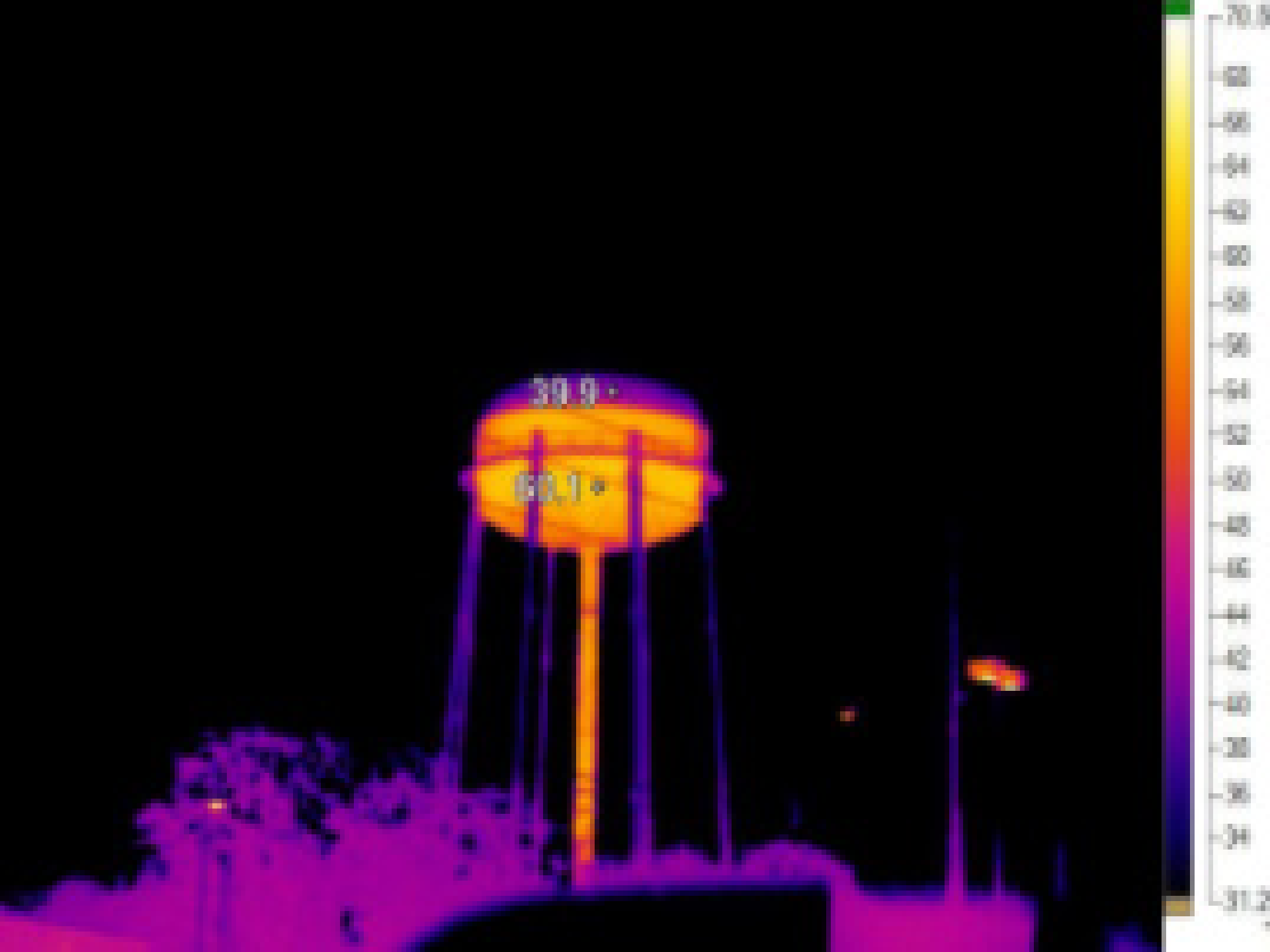
- Detect delamination and spalling defects in concrete structures
- Map heat flow and prevent thermal bridging due to faulty insulation
- Perform forensic moisture intrusion inspections of plumbing facilities
- Detect insulation leaks in HVAC or refrigeration equipment

- Proactively identify areas of concern for moisture leaks, delamination of roofing materials
- Locate and isolate leaks emanating from buried pipelines
- Find line blockages in fluid transmission systems above ground
- Detect thermal patterns and monitor temperatures on boiler tubes
- Proactively monitor liquid levels in large storage tanks to detect leaks



61.2 °C

-35.1



39.9

33.1

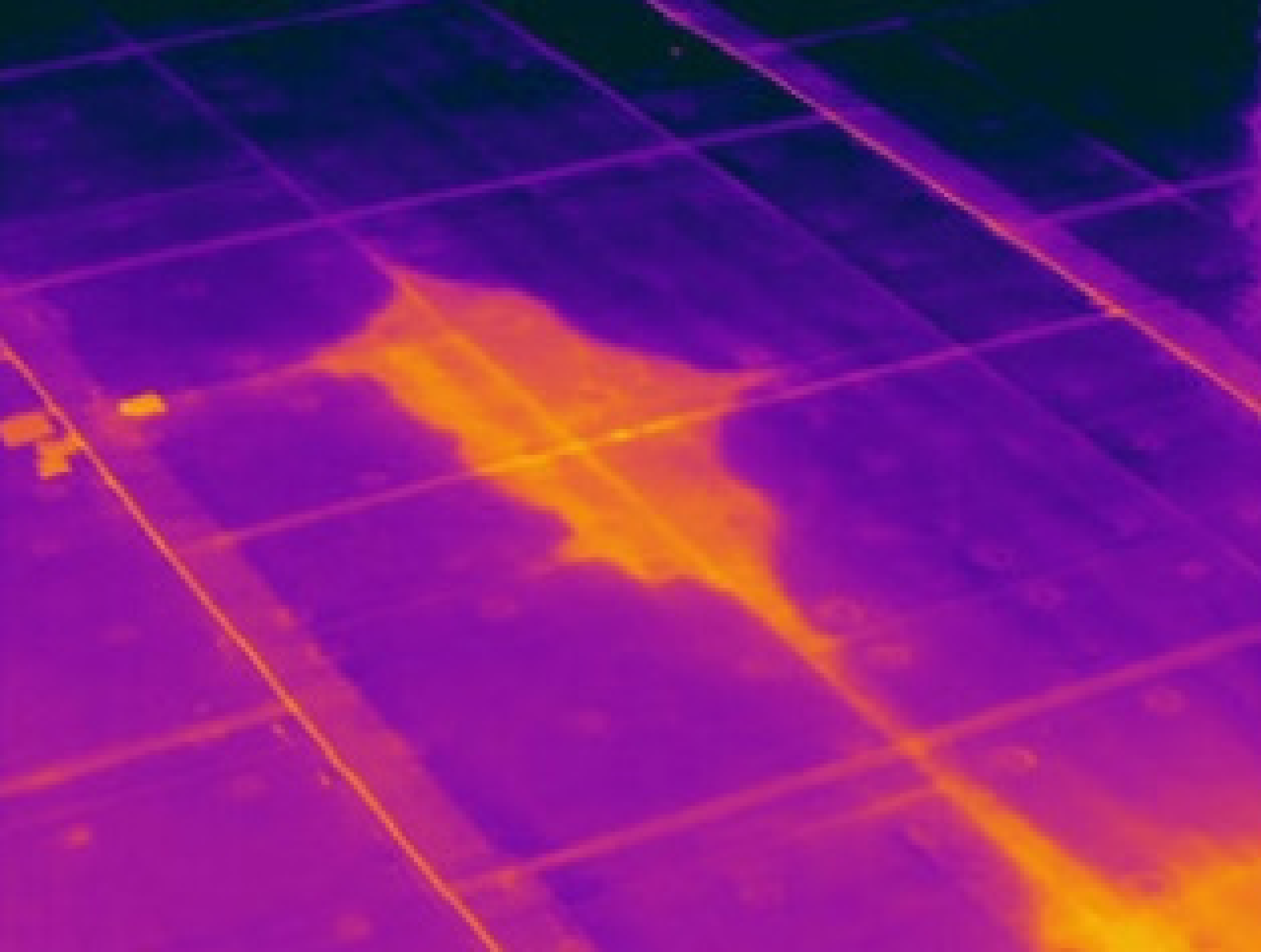


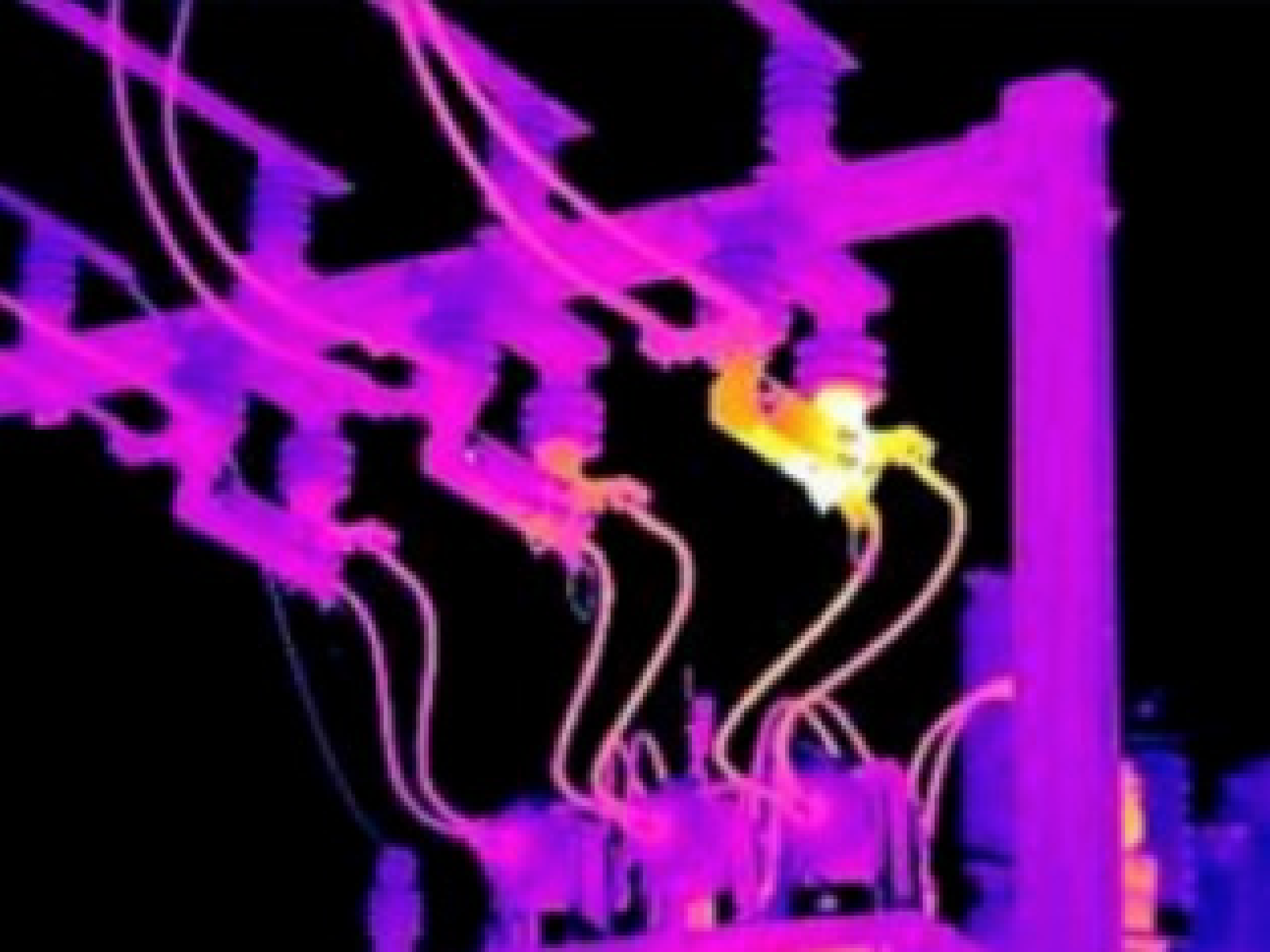
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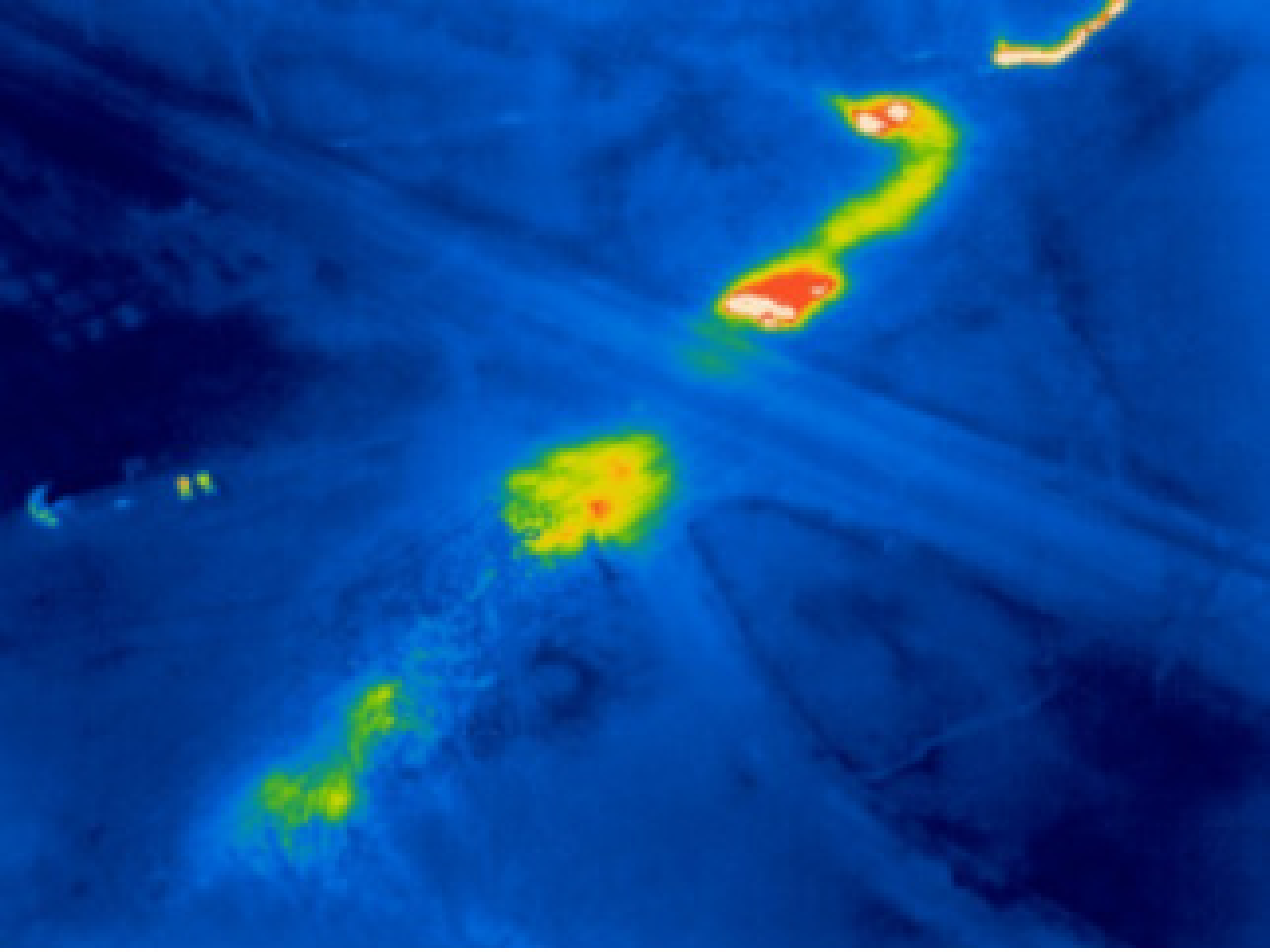
50.0

30.0

10.0







MAPPING

Photogrammetry

LIDAR

Photogrammetry

The use of photography in surveying and mapping to measure distances between objects.

a well-established technique for acquiring dense 3D geometric information for real-world objects from stereoscopic image overlap and has been shown to have extensive applications in a variety of fields.

2D aerial photos create 3D models and points clouds, which allows lengths, areas, volumes of structures and points of interest to be measured and then analyzed in GIS software

Create maps of hard-to-access areas.

Monitor change, perform land analysis and inspections.

LIDAR

Light Detection And Ranging - measures the time it takes light to bounce off the earth and return to a sensor – at **300,000 light pulses per second** and **250 elevations per square foot**, resulting in high resolution, 3D models.

Types of Aircraft

Mavic Pro



Inspire



Matrice 600



Matrice 210



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