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TRANSMISSION TALK TUESDAY

Episode #81

Thermal Imaging

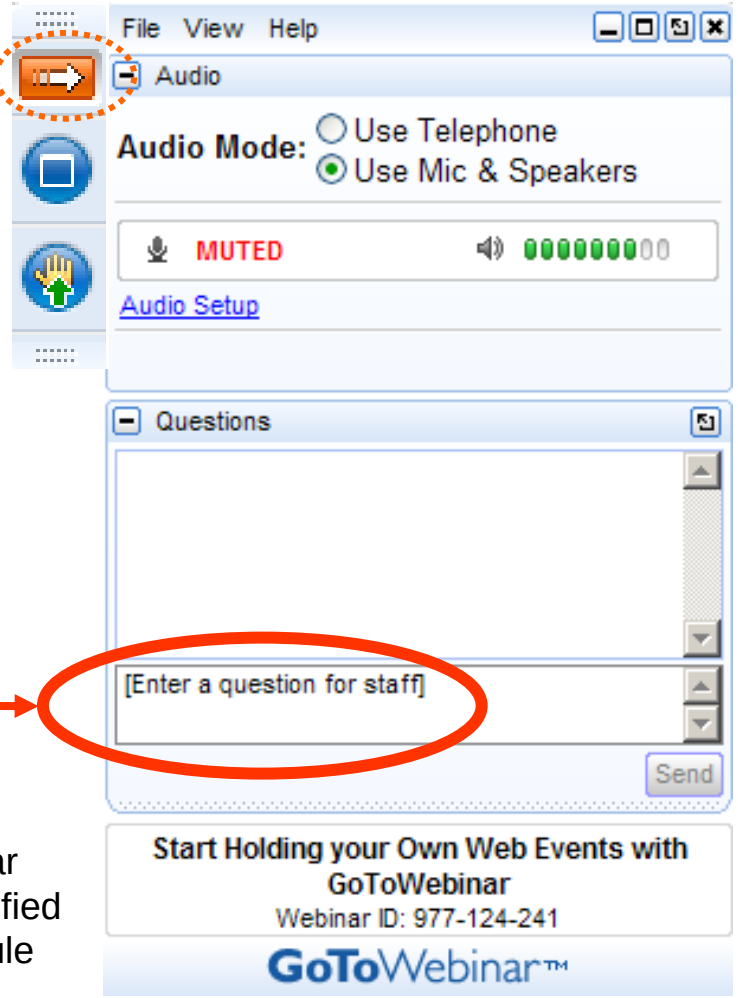
nautel

AM/FM Radio Transmitters

Your questions please?

(if you don't see the control panel, click on the orange arrow icon to expand it)

Please enter your questions in the text box of the webinar control panel (remember to press send)



Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.

Advance Questions

Is it worth an engineer to get certified as a thermographer. What is your take on prosumer level thermal imaging drones (DJIMav)

Not all IR cameras are the same

a. Manufacturers include Teledyne-Flir, Fluke, and even DJI.

b. Post-processing thermal analysis software is often not interchangeable between manufacturers.

c. If the camera is not “radiometric”, you will not have temperature data to analyze – no post processing

d. Cheaper cameras often are not radiometric – but they are usable for quantitative measurements

e. Analysis “color palette” choices can be important for interpreting what you are seeing

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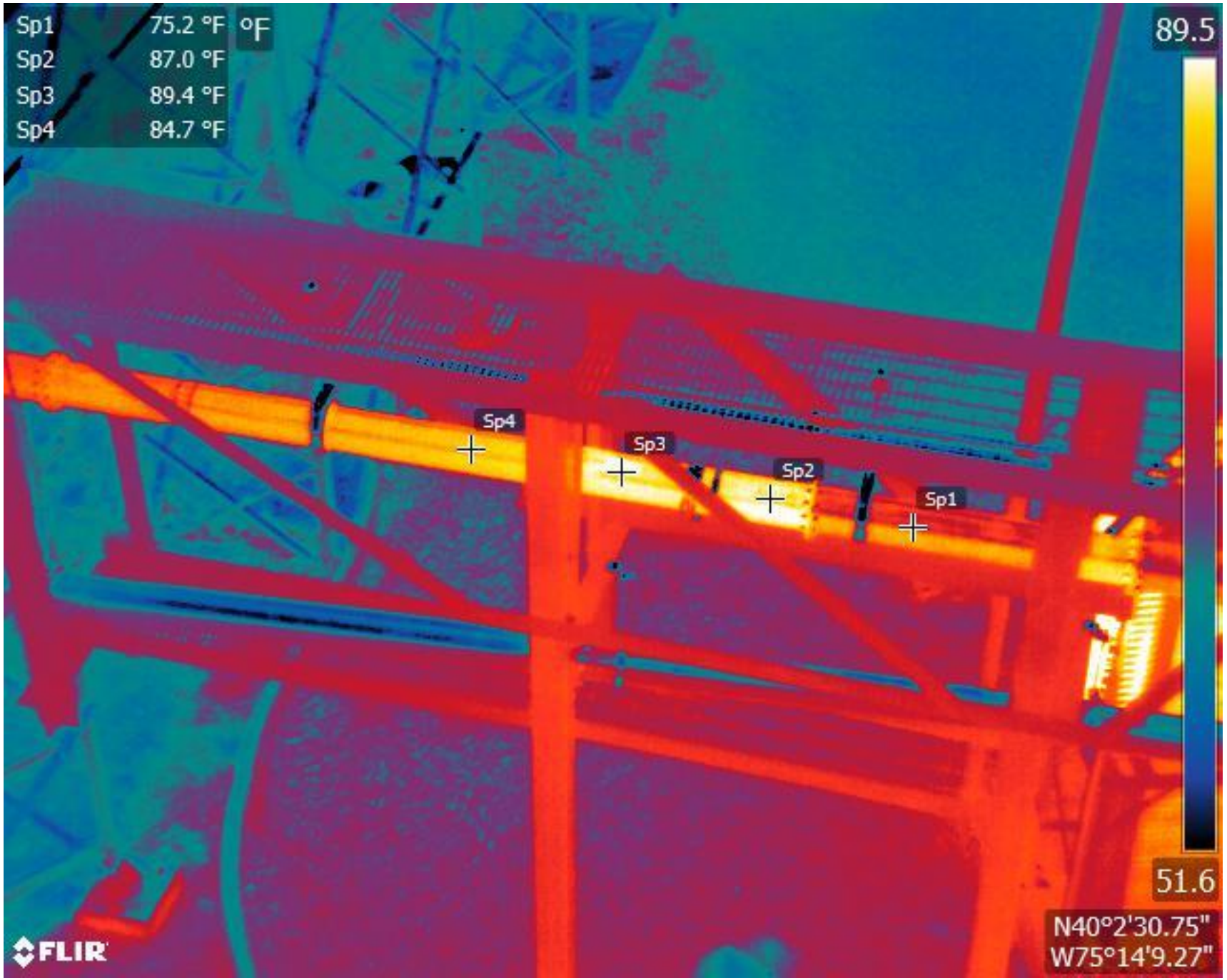
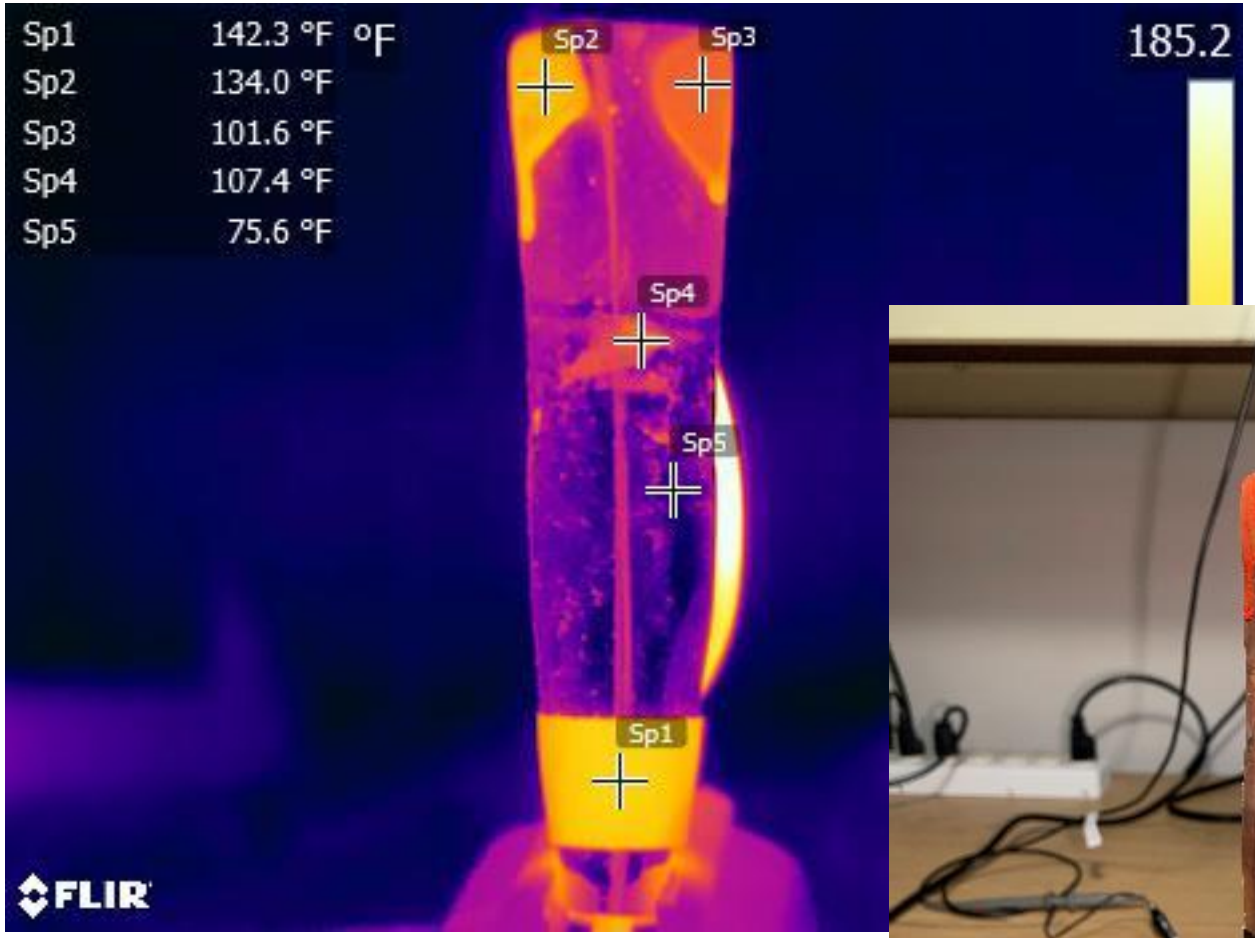
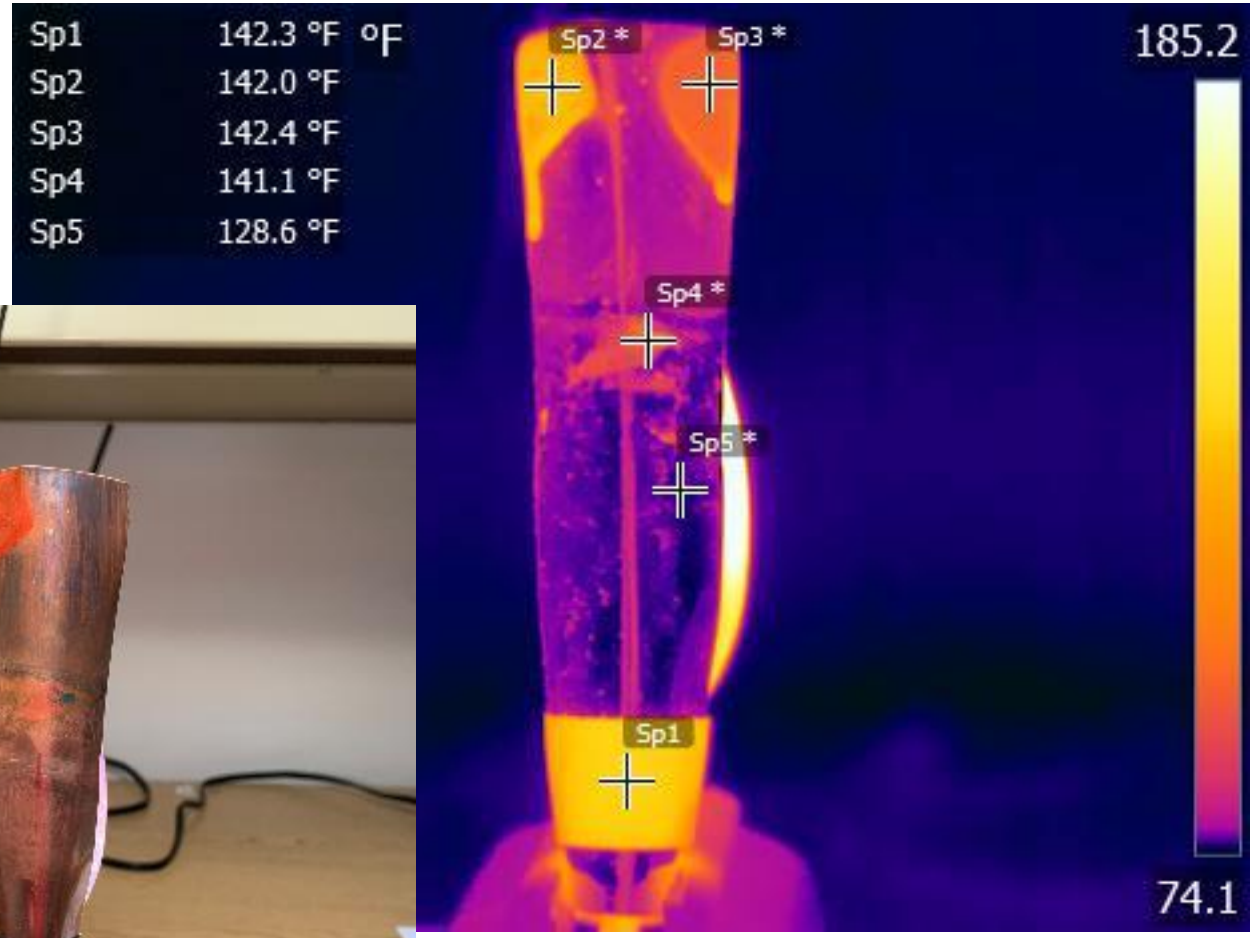

Sp1 75.2 °F
Sp2 87.0 °F
Sp3 89.4 °F
Sp4 84.7 °F
°F
89.5
51.6
Sp4
Sp3
Sp2
Sp1
FLIR
N40°2'30.75"
W75°14'9.27"





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“Qualitative” versus “Quantitative” Imaging - Do you really need to do quantitative measurements?

a. Qualitative means comparing relative temperature differences by eye – using color as a guide
    i. Qualitative imaging gives you “apparent temperatures” – not “true temperatures”
    ii. Qualitative imaging is great for many applications
b. Quantitative is a more work intensive approach that gives you true temperature data

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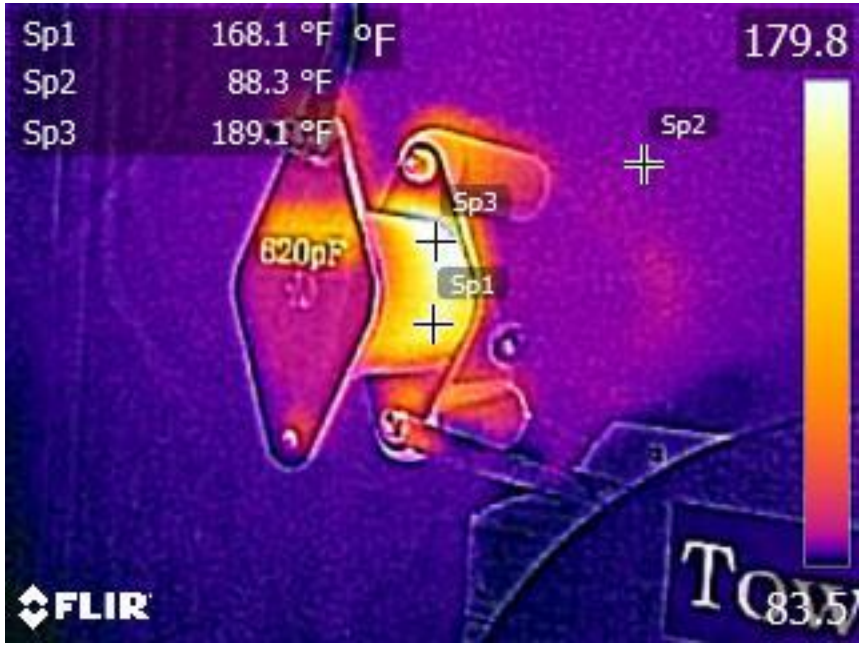
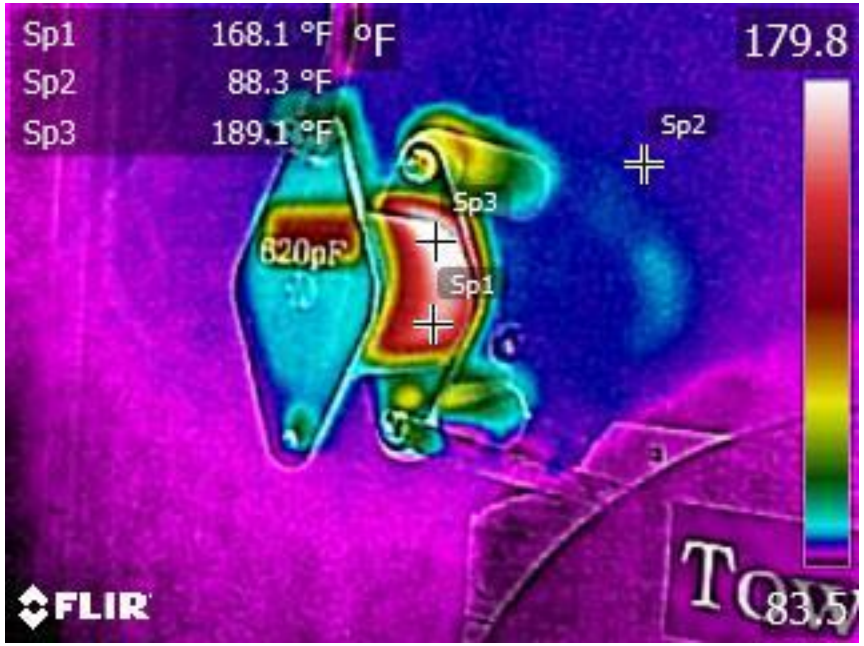
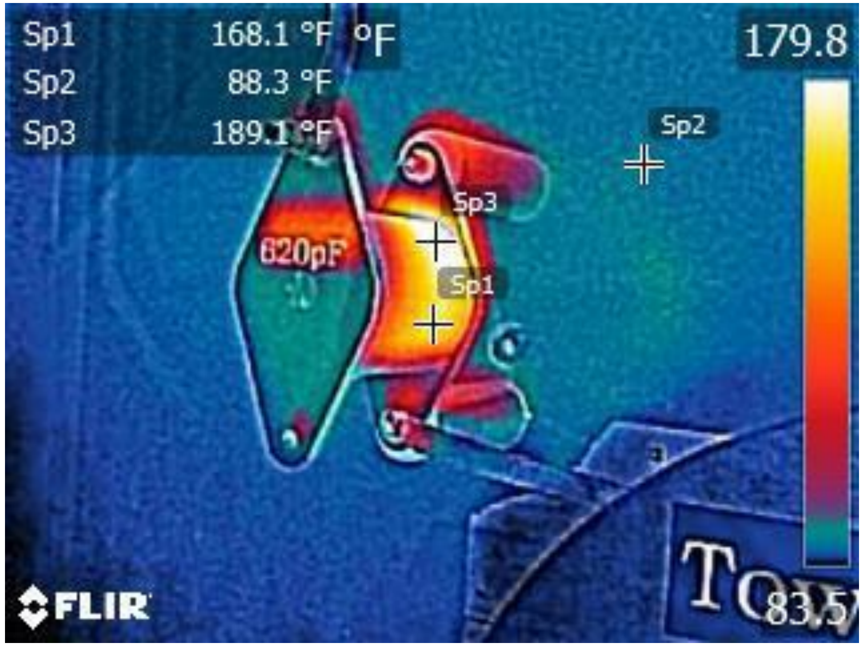
Quantitative measurements require you to consider:

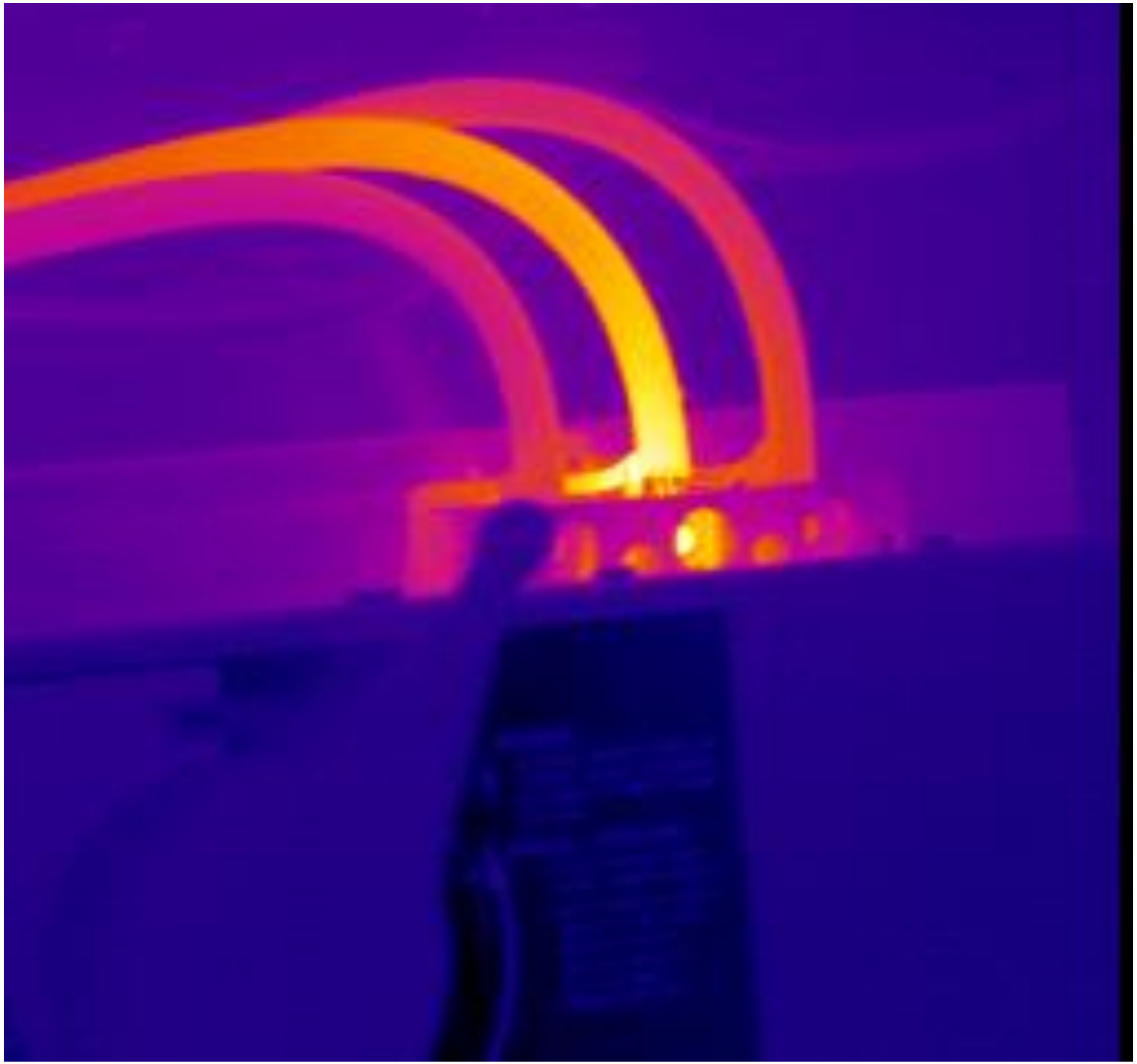
a. Emissivity of the object – caused by the nature of the material (color, roughness)
b. Reflectivity of the environment
c. Measured distance, wind, humidity - Wind can change a reading significantly
d. Focus
e. Angle of observation (can impact results significantly)
f. Putting the area that you want to measure in the camera reticule (gunsight) is essential


620pF
Tow


Sp1 168.1 °F
Sp2 88.3 °F
Sp3 189.1 °F
°F
179.8
Sp2
Sp3
Sp1
620pF
FLIR
83.5


Sp1 168.1 °F
Sp2 88.3 °F
Sp3 189.1 °F
°F
179.8
Sp2
Sp3
Sp1
620pF
FLIR
83.5


Sp1 168.1 °F
Sp2 88.3 °F
Sp3 189.1 °F
°F
179.8
Sp2
Sp3
Sp1
620pF
FLIR
83.5



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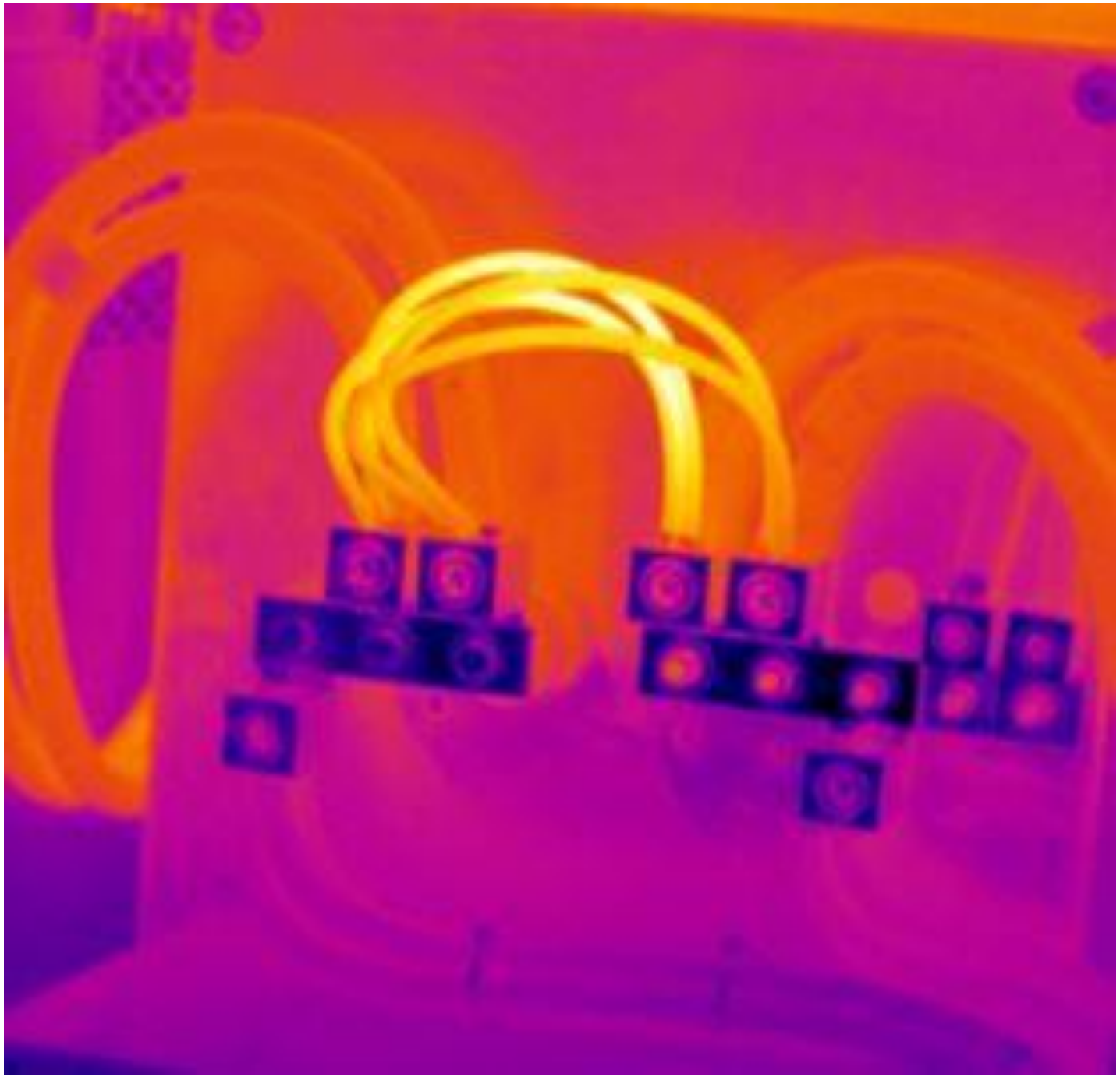

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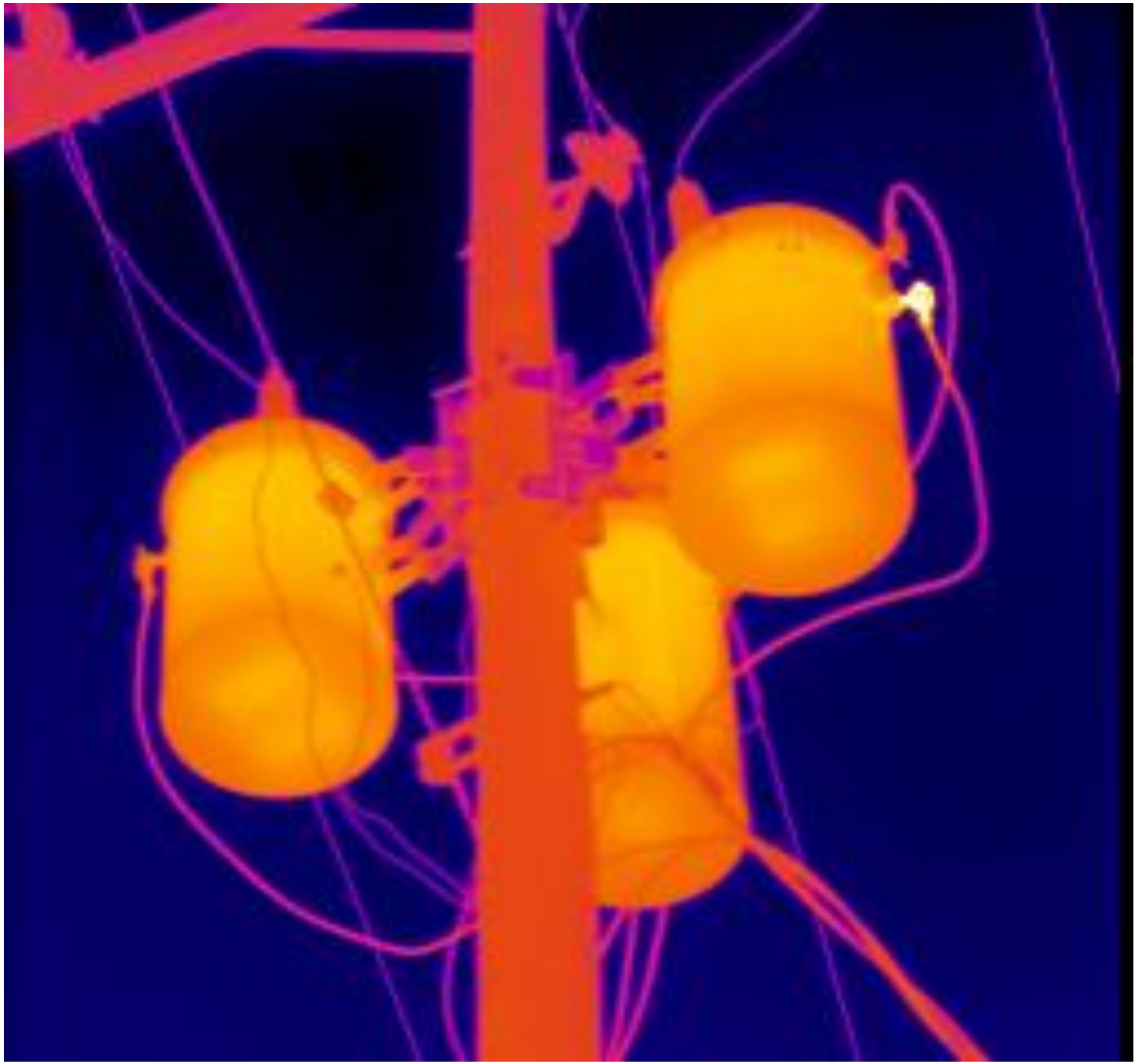
Issues with any thermal imaging method

a. Object color, finish
b. Thermal Reflections
c. Viewing angle
d. Wind speed (will impact reading by up to 30 to 40%)
e. Thermal loading by other things in the environment
f. Cycle through available thermal palettes as part of your analysis (as shown with the capacitor photos a few slides back)
g. Pay attention to what you are seeing- does it make sense?



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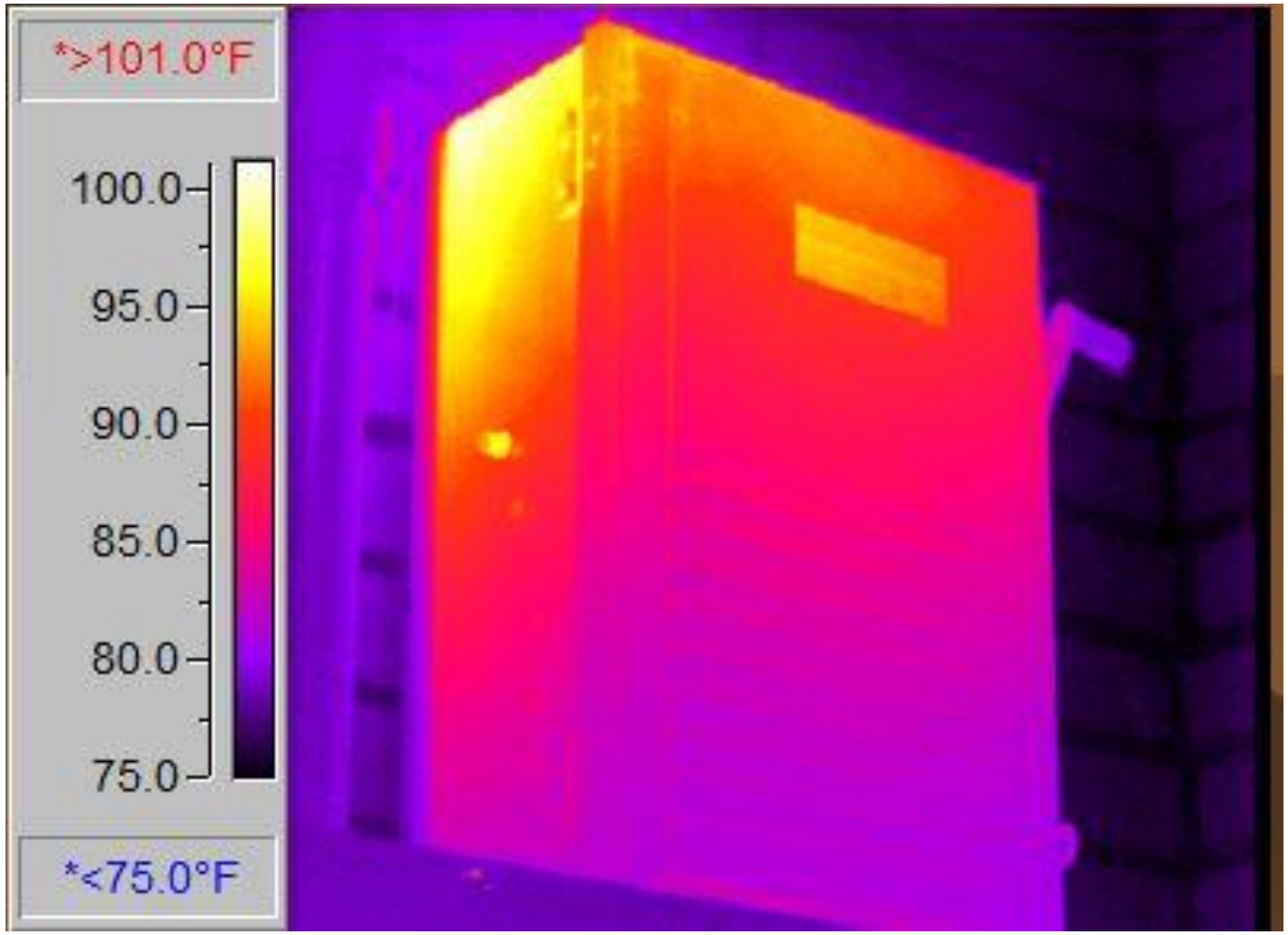
*>101.0°F
100.0
95.0
90.0
85.0
80.0
75.0
*<75.0°F

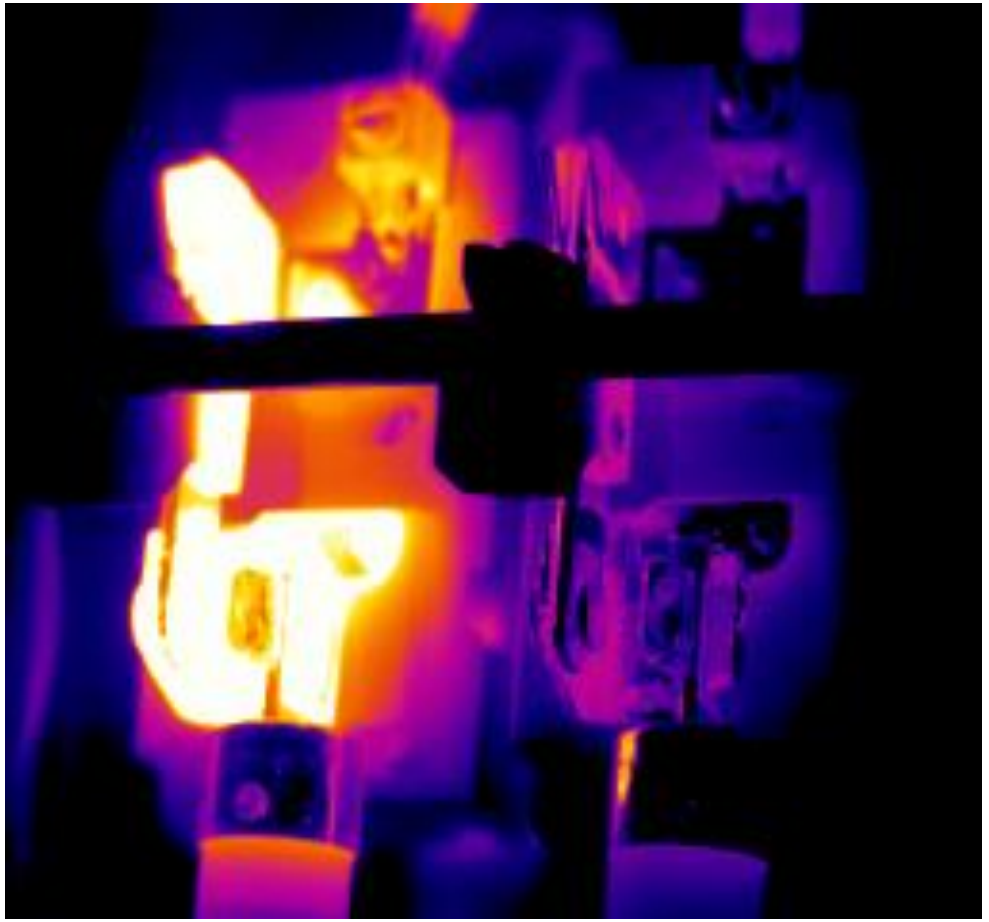

Photo courtesy Brad Beahm, Flood Communications

“One of your webinars years ago prompted me to buy a FLIR that attaches to my phone.

This was what I found at a site that had frequent problems with power stability. Replaced the panel and had all new main wiring put in.

Site's power has been fine since.”

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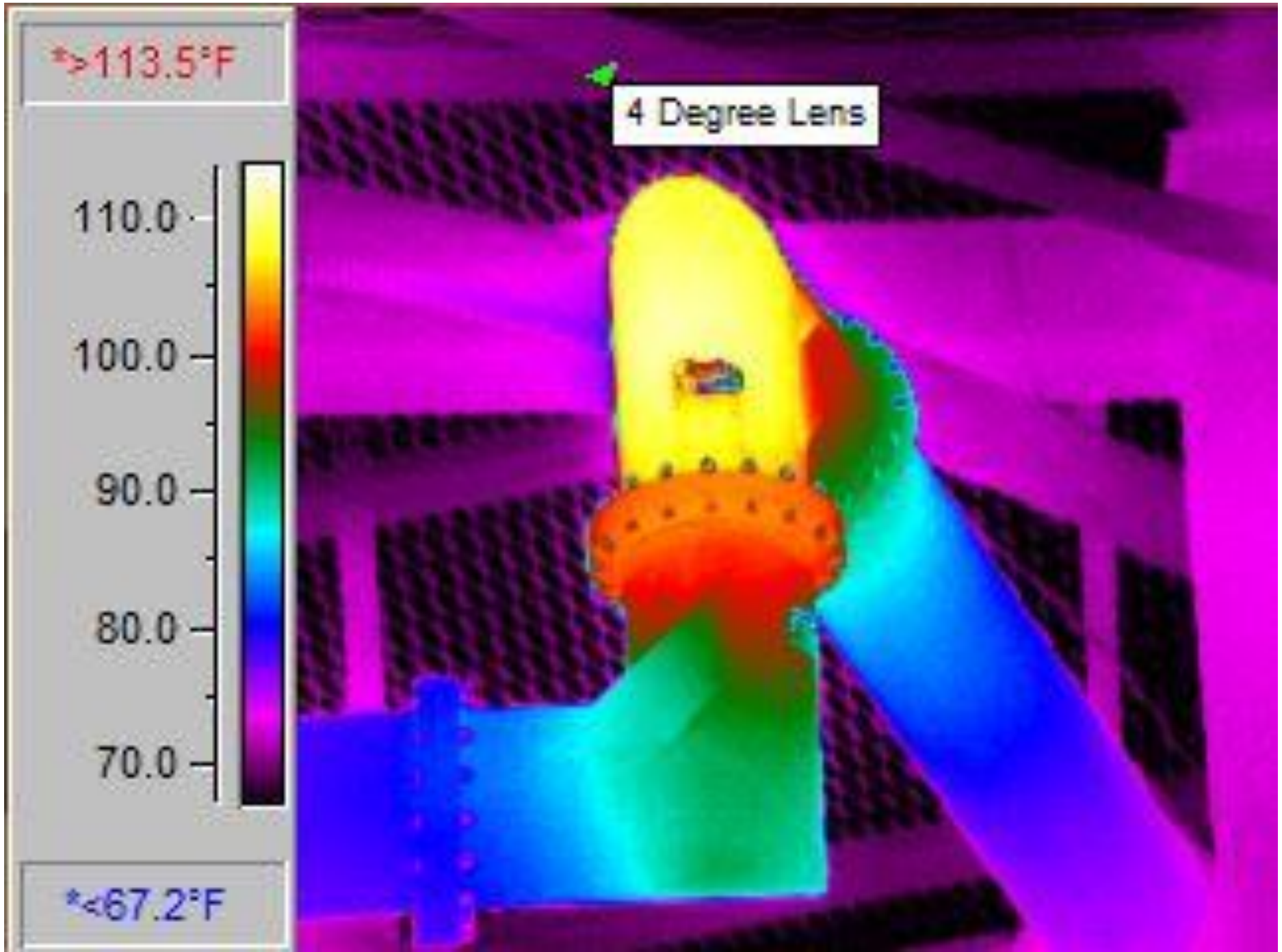
Safety

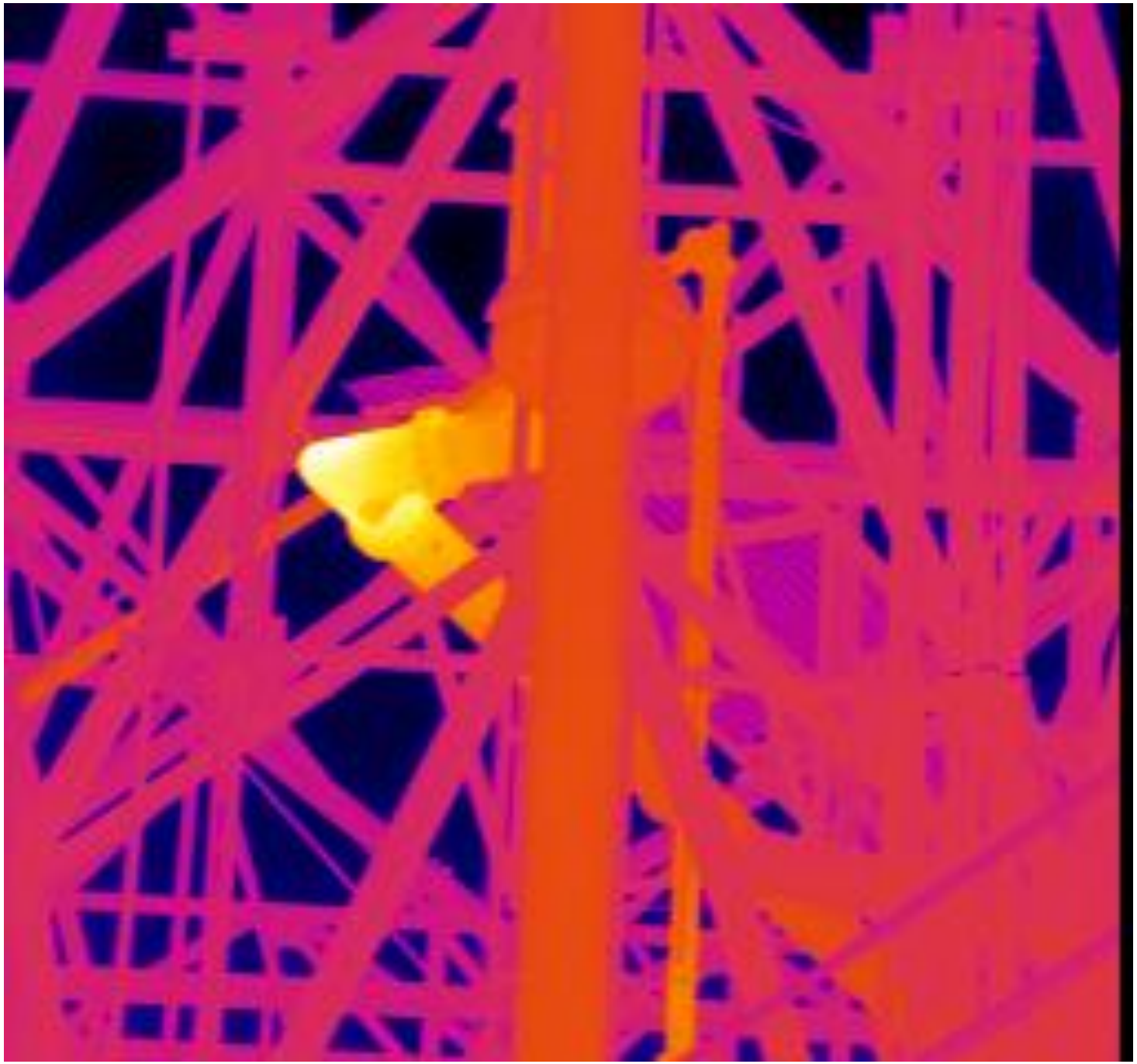
a. Arc Flash and electrical shock safety are important

b. Do NOT open electrical panels without having the right training and equipment

c. Work with an experienced electrician – have them open the panels while you maintain a safe distance.

d. Some panels have IR observation ports – learn how to use these with your system.


*>113.5°F
4 Degree Lens
110.0
100.0
90.0
80.0
70.0
*<67.2°F



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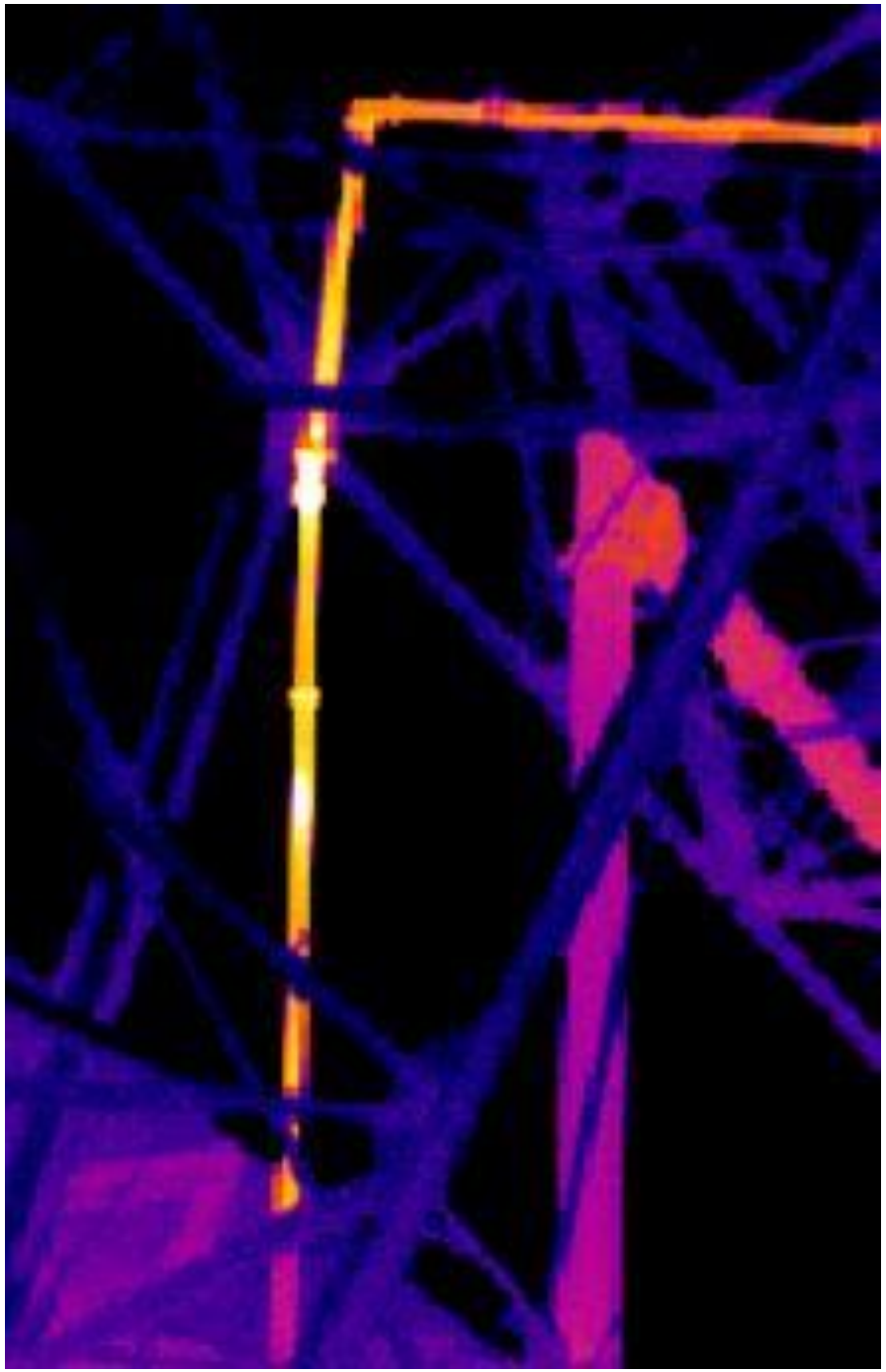

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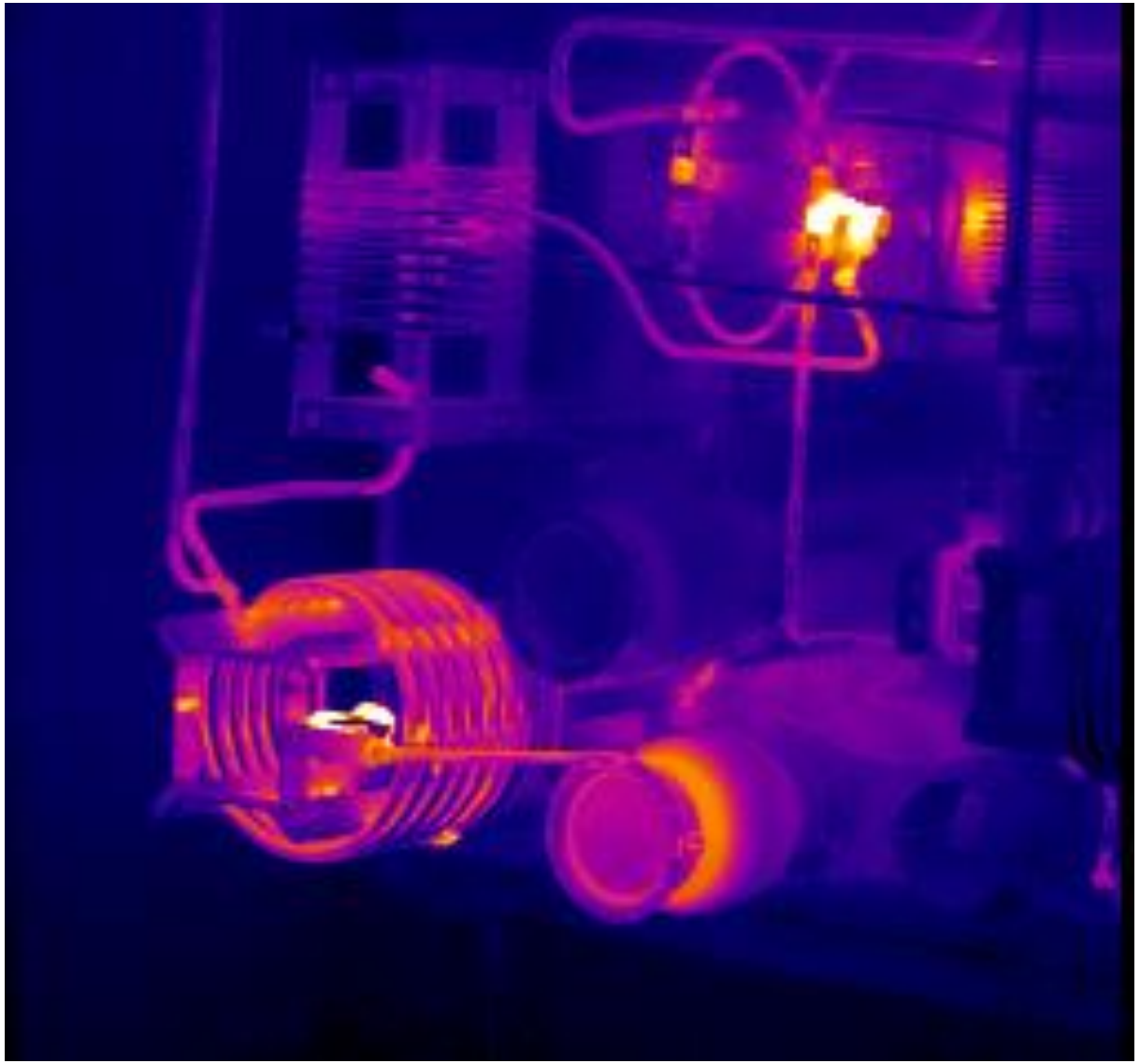

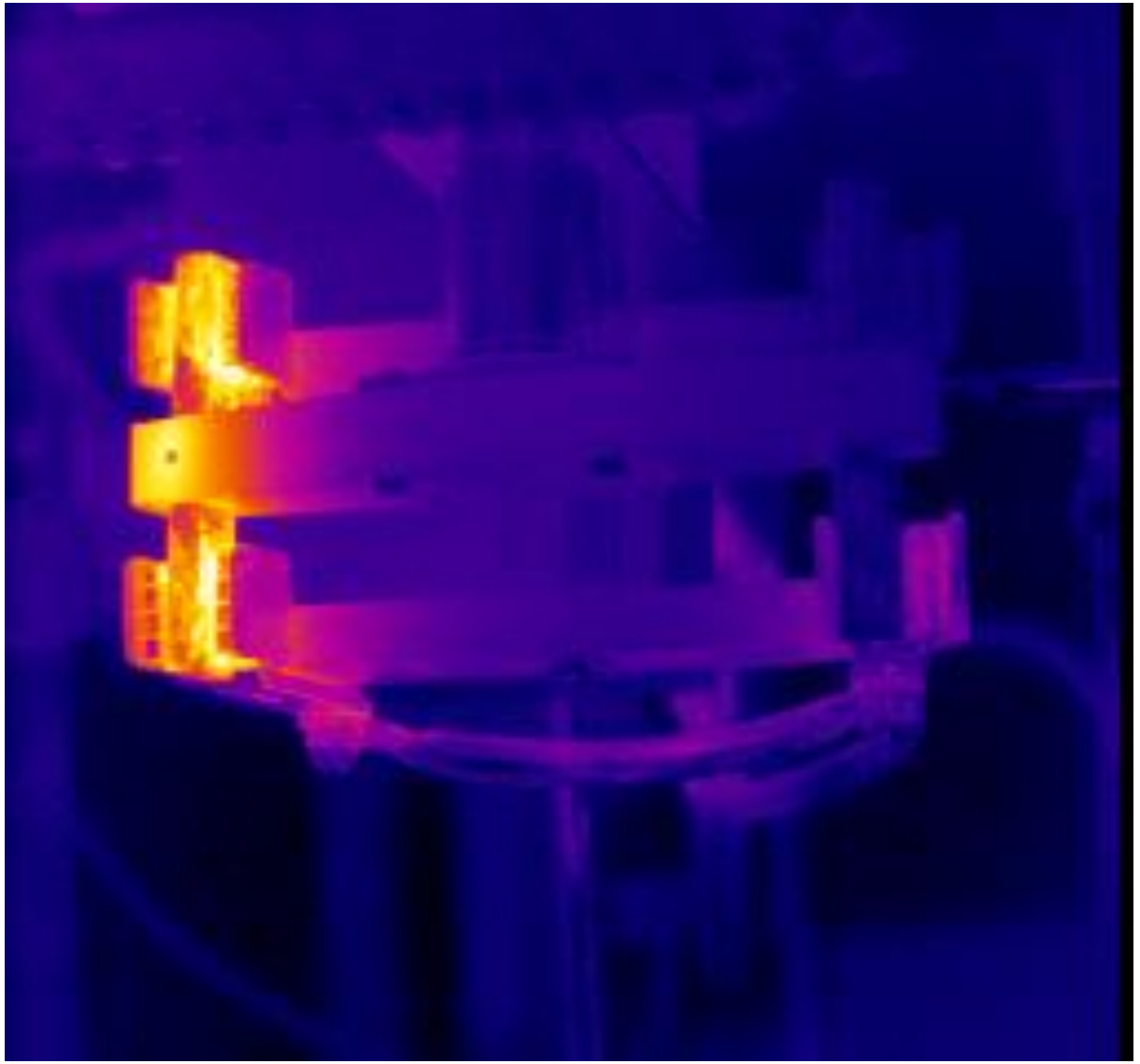

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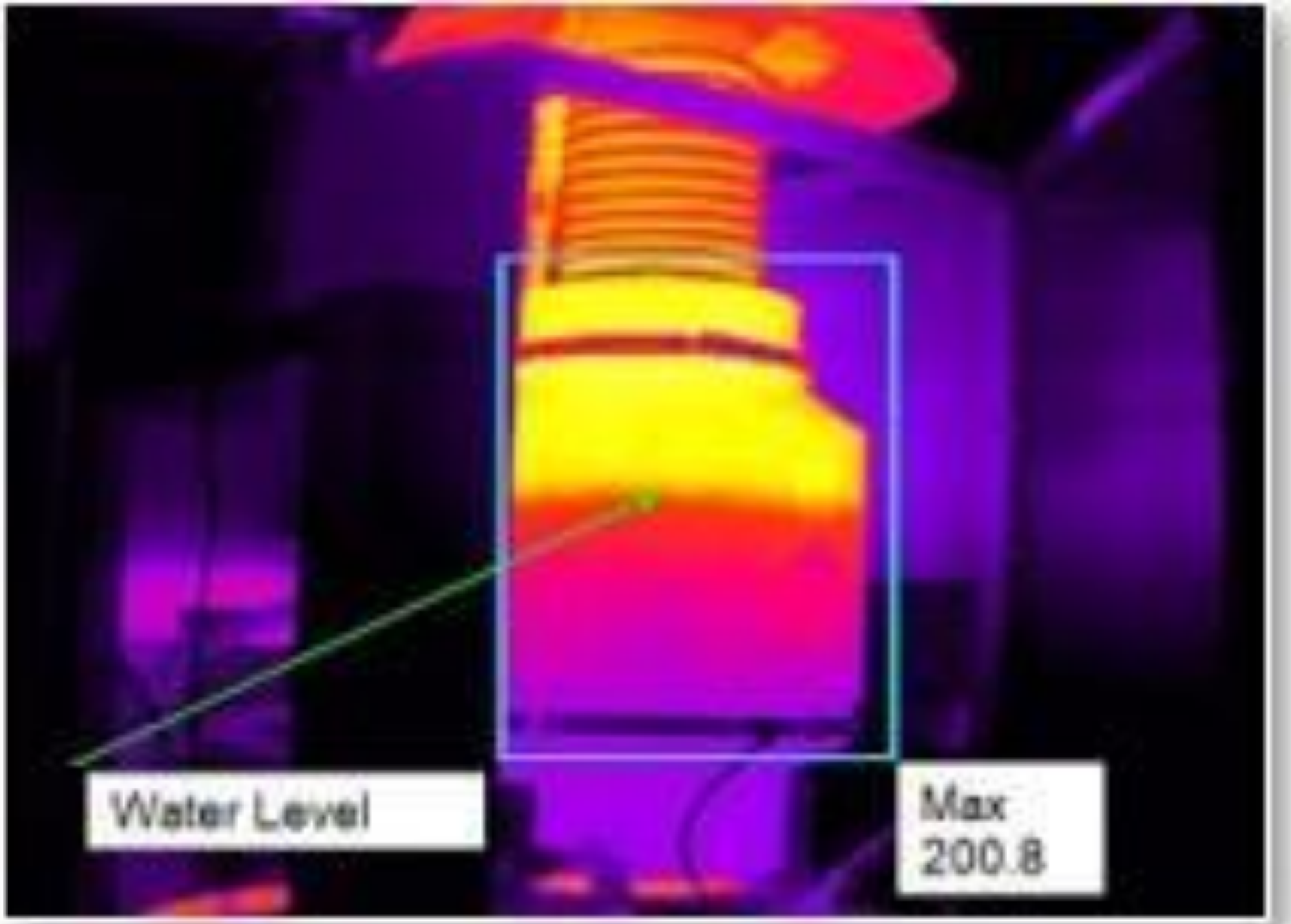
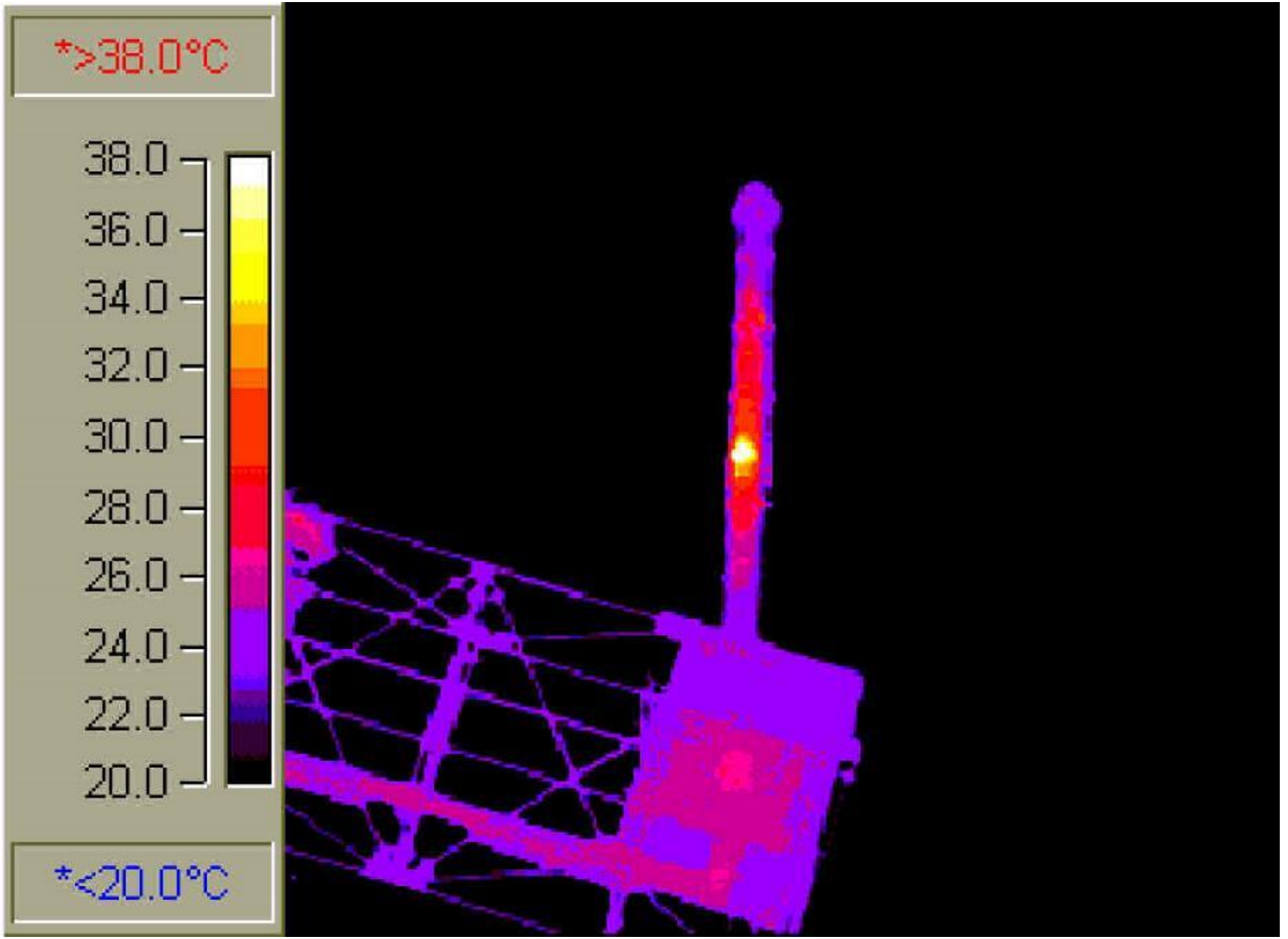

Water Level
Max
200.8

Drone mounted thermal camera systems

a. Outside component are impacted by ambient temperature
b. Solar loading lasts a long time – can mask problem areas
c. Wind, which changes intensity with altitude, will be a problem
d. Qualitative observations are really the only defendable observations



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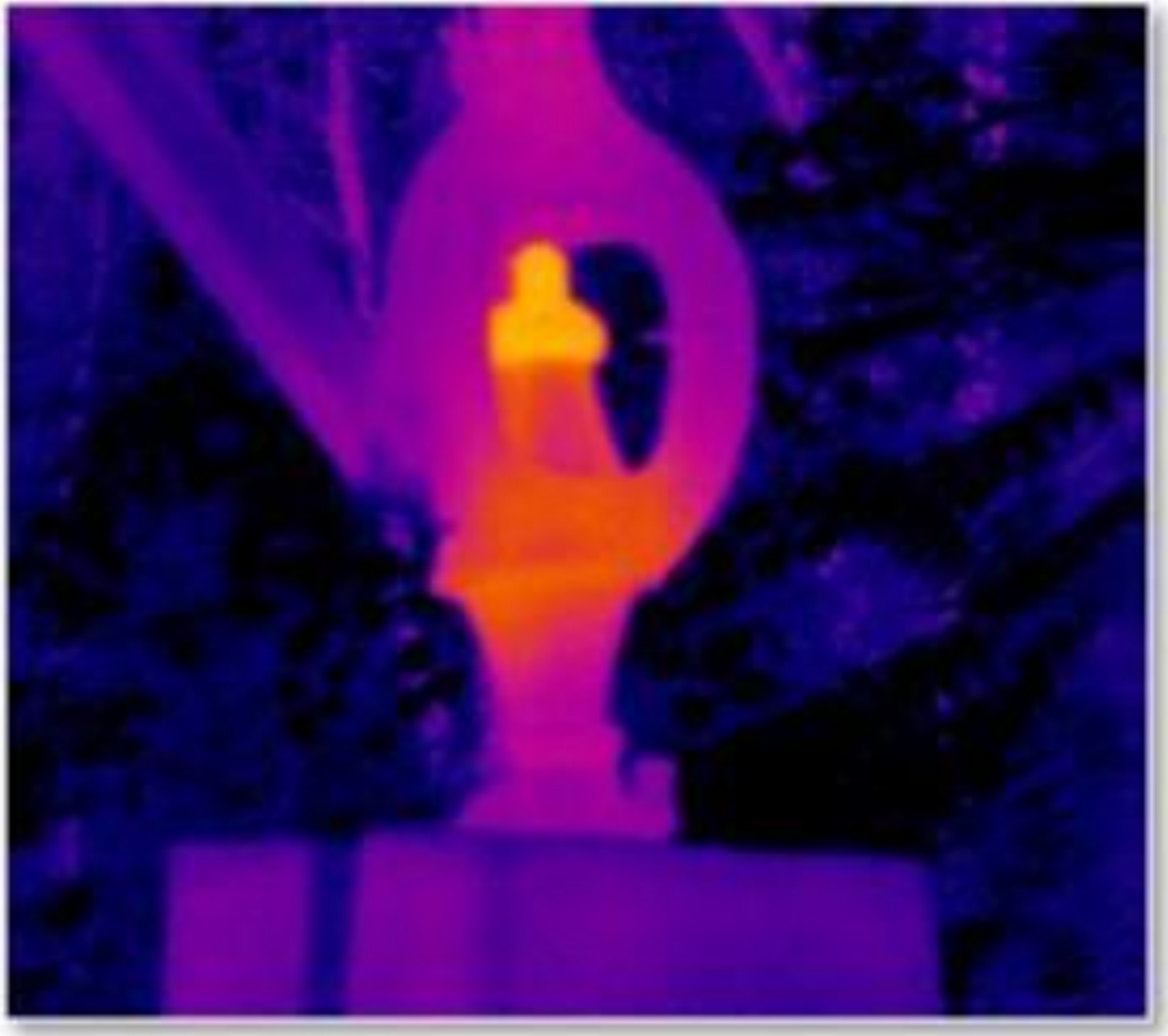

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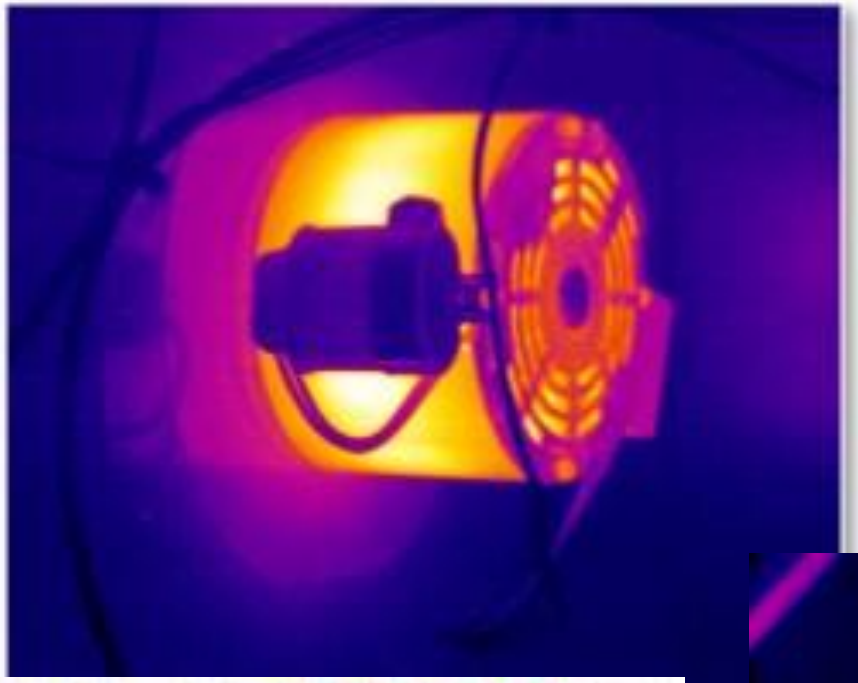

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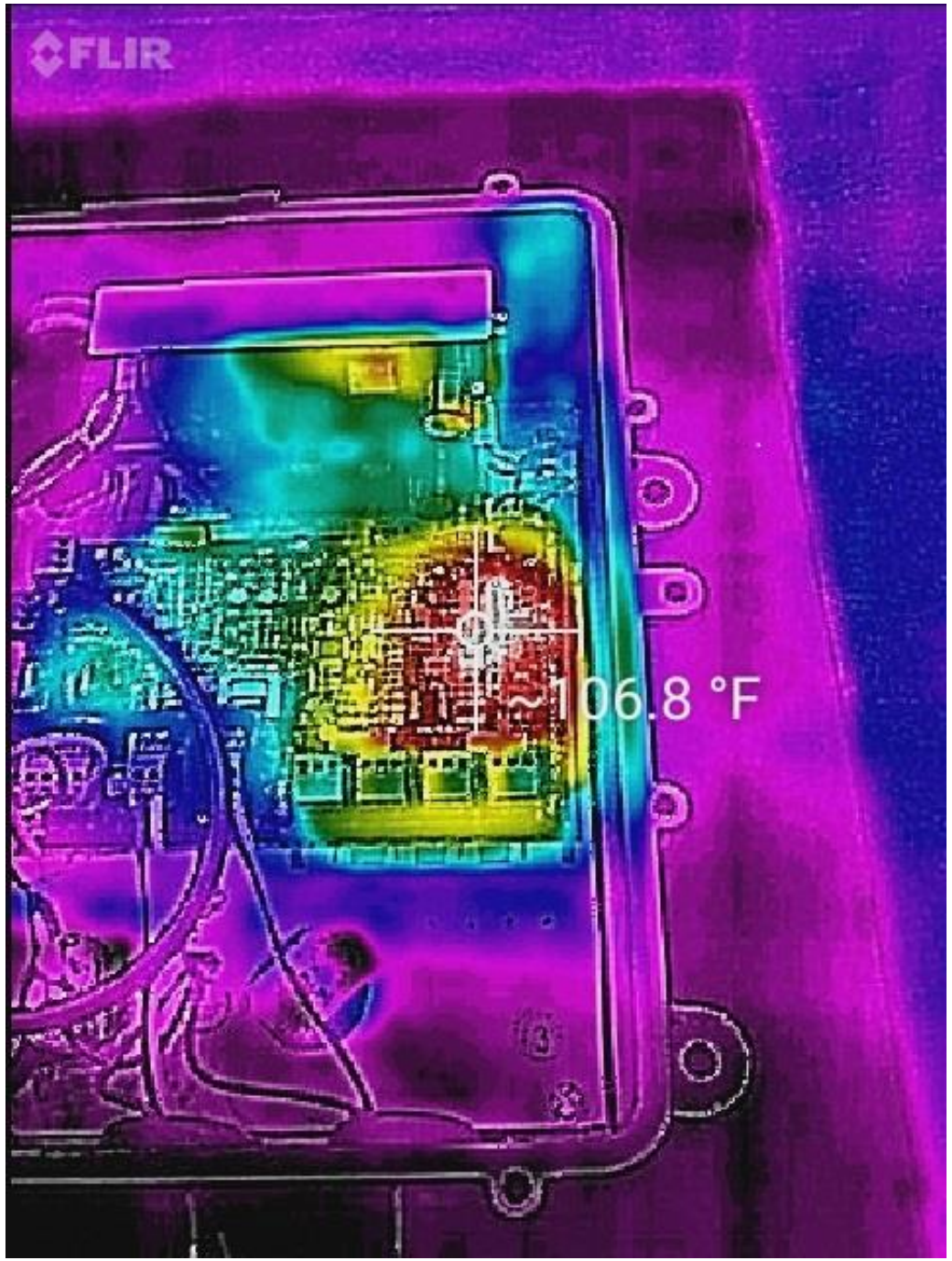
FLIR
106.8 °F


31.4°
FLIR

You CAN do this! – But getting proper training and experience is essential

a. For example, Teledyne Flir has its Infrared Training Center (ITC)
    i. They provide in person and online classes and training videos
    ii. They provide professional certification training and testing

Remember emissivity, reflectivity and transmissivity

a. If you see yourself reflected in the image, odds are the readings aren't accurate!
b. On windy days, outdoor readings may vary significantly from calm days
c. Just because you can see through something doesn't mean it's transparent to an infrared camera.

Online Information

Webinars
https://www.nautel.com/resources/webinars/

Nautel Waves Newsletter
https://www.nautel.com/newsletters/

YouTube
http://www.youtube.com/user/NautelLtd

Online Info, such as the Broadcasters' Desktop Resource
https://www.thebdr.net/

Teledyne FLIR online training and resources
https://www.infraredtraining.com/
https://www.flir.com/suas/delta/

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THANK YOU!

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