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QualiTest IR Radiometric Survey Report



Chemours
Power House, wells and sub stations

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Job Number	141217
Survey Date	11/18-20/19
Report Date	11/20/19

QualiTest IR Radiometric Survey Report



All electrical panels were scanned using a FLIR P60 infrared camera. The following report only contains defects that were found during the survey. Below is our classification system for each defect contained in this report. If there are any questions or comments, please feel free to contact us at any time.

Hi-Speed Industrial Service QualiTest Diagnostics employs a three-step defect rating system:

CLASS I - A defect or defects are present that are likely to cause a problem in the long term (2-6 months). Should be addressed in the normal course of maintenance scheduling; continue to monitor.

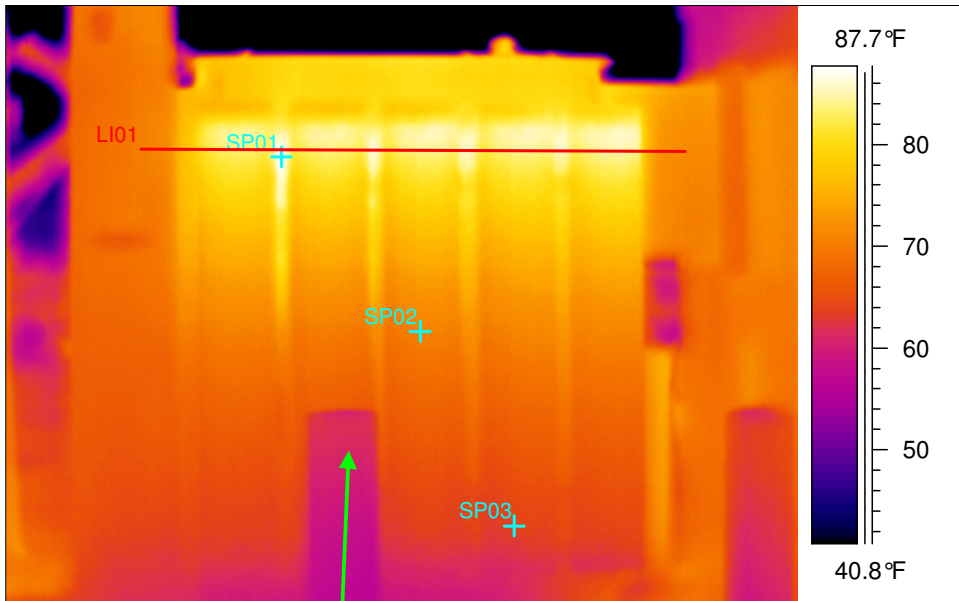
CLASS II - A defect or defects are present that are likely to cause a failure in the short term (less than 2 months). Should be addressed as soon as is practical, on a high maintenance priority. Consideration should be given to increased monitoring frequency.

CLASS III - A defect or defects are present that make continued component reliability unpredictable, and likelihood of secondary damage is high. Consideration should be given to an unscheduled shutdown to correct.

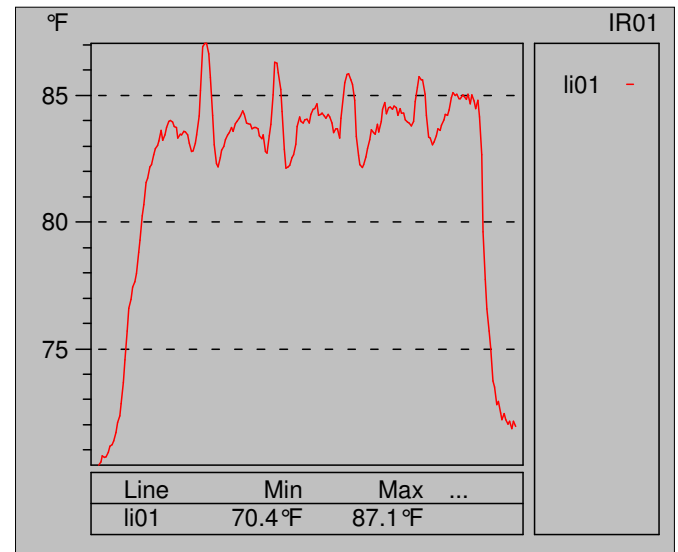
Hi-Speed Industrial Service tests and inspects industrial and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information provided herein is provided as an opinion only, not as a guaranty or warranty of.



Component	Equipment/Bucket ID	Plant/Area	Date
North Radiator	SUB 259	Chemours	11-18-19



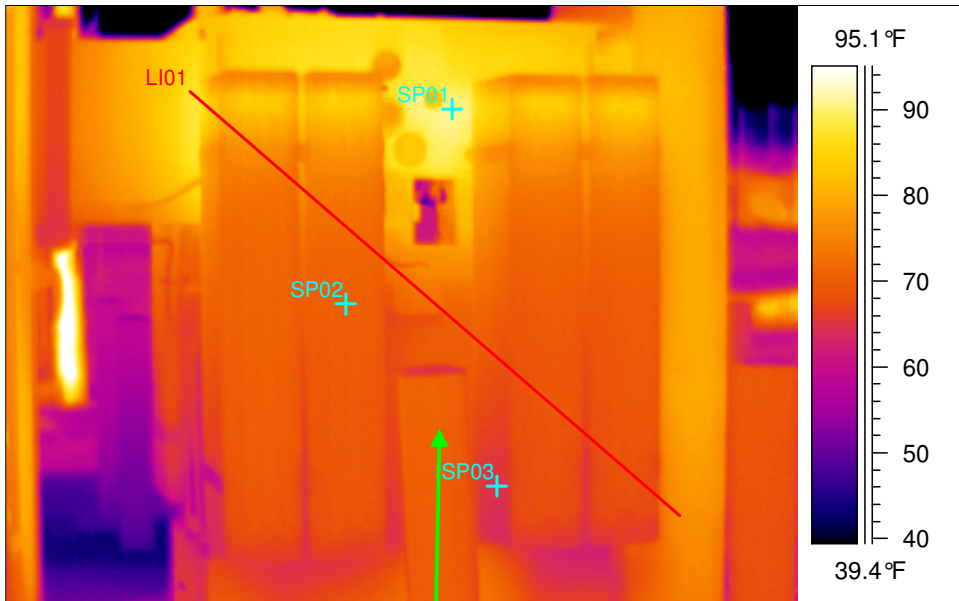
Label	Value
IR : max	87.5°F
IR : min	8.3°F
SP01	87.3°F
SP02	71.0°F
SP03	63.8°F
LI01 : max	87.1°F
LI01 : min	70.4°F



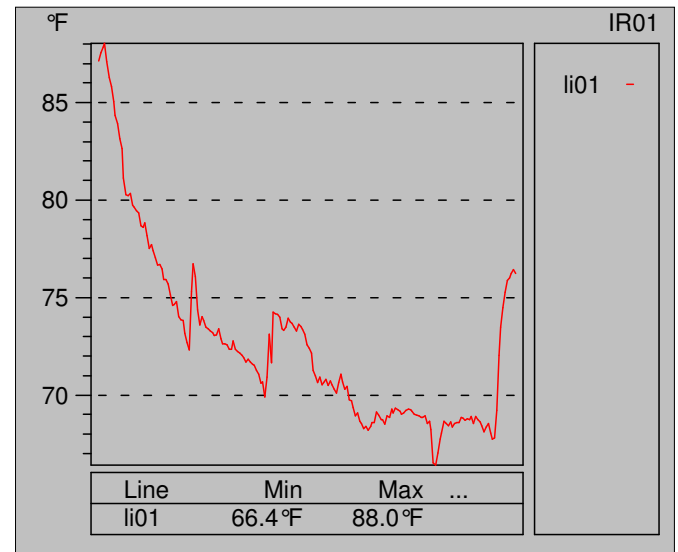
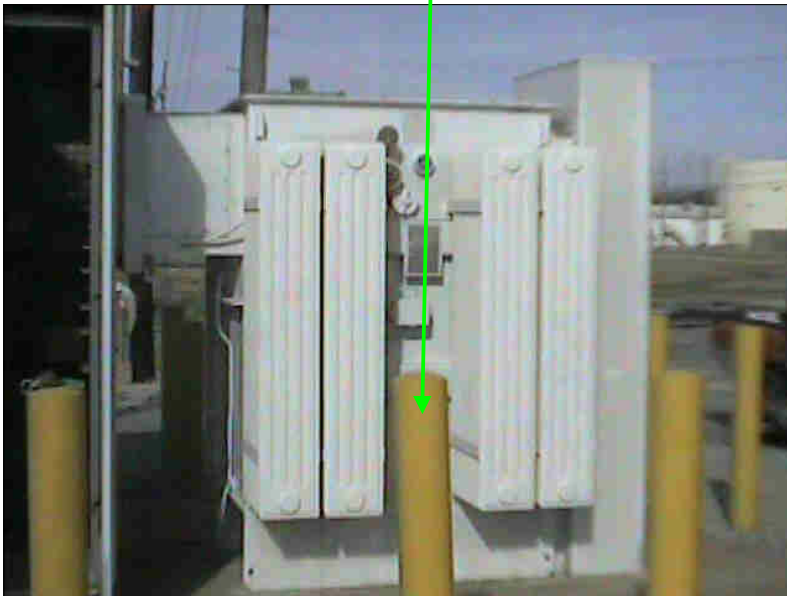
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
South Radiator	SUB 259	Chemours	11-18-19



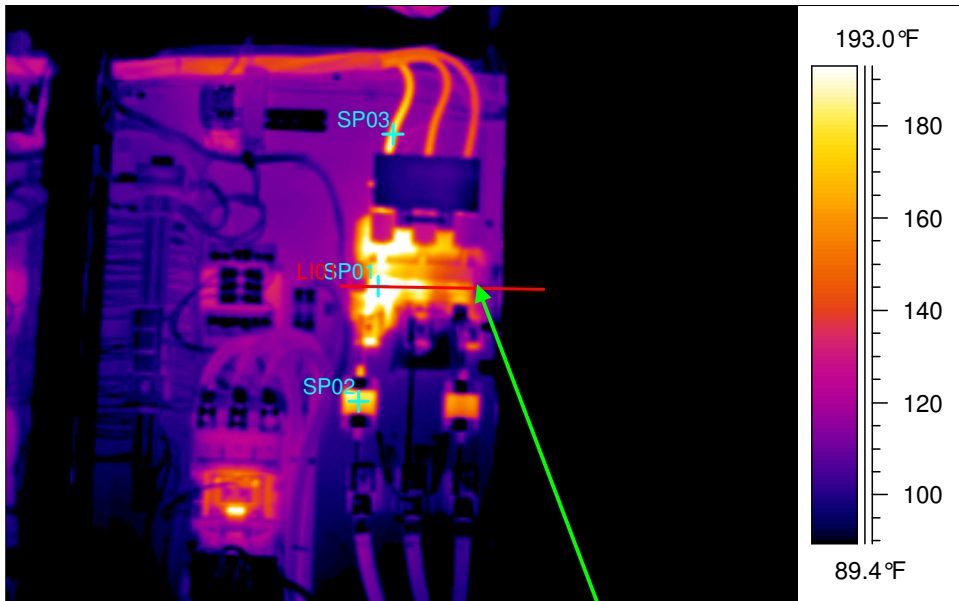
Label	Value
IR : max	98.7°F
IR : min	12.8°F
SP01	91.0°F
SP02	70.6°F
SP03	64.7°F
LI01 : max	88.0°F
LI01 : min	66.4°F



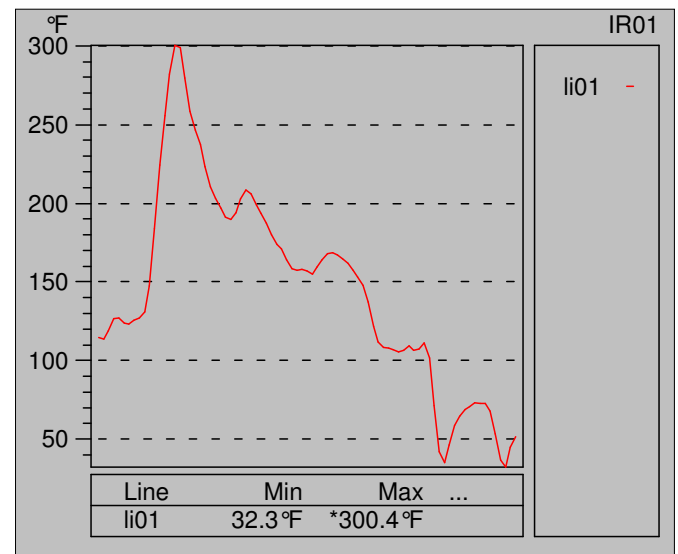
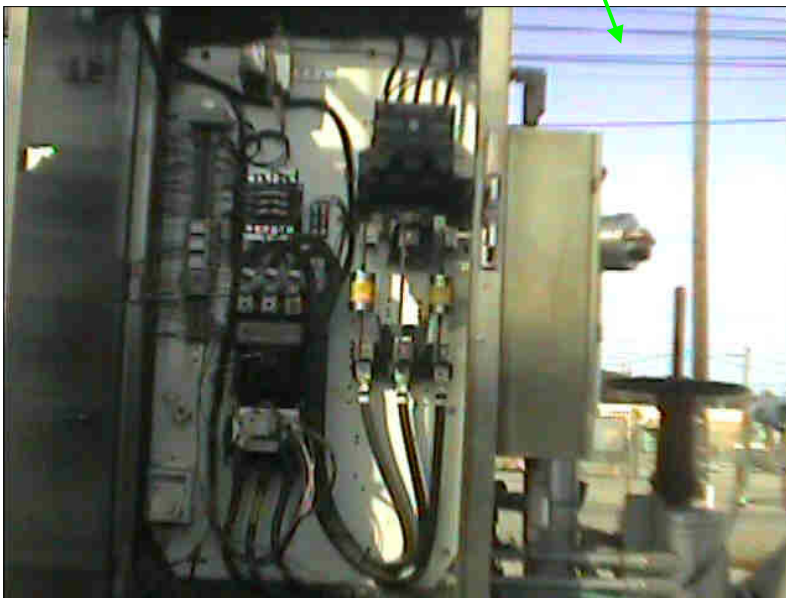
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Main Switch	Well Pump 1	Chemours	11-18-19



Label	Value
IR : max	*301.8°F
IR : min	-27.1°F
SP01	*300.4°F
SP02	174.6°F
SP03	187.2°F
LI01 : max	*300.4°F
LI01 : min	32.3°F



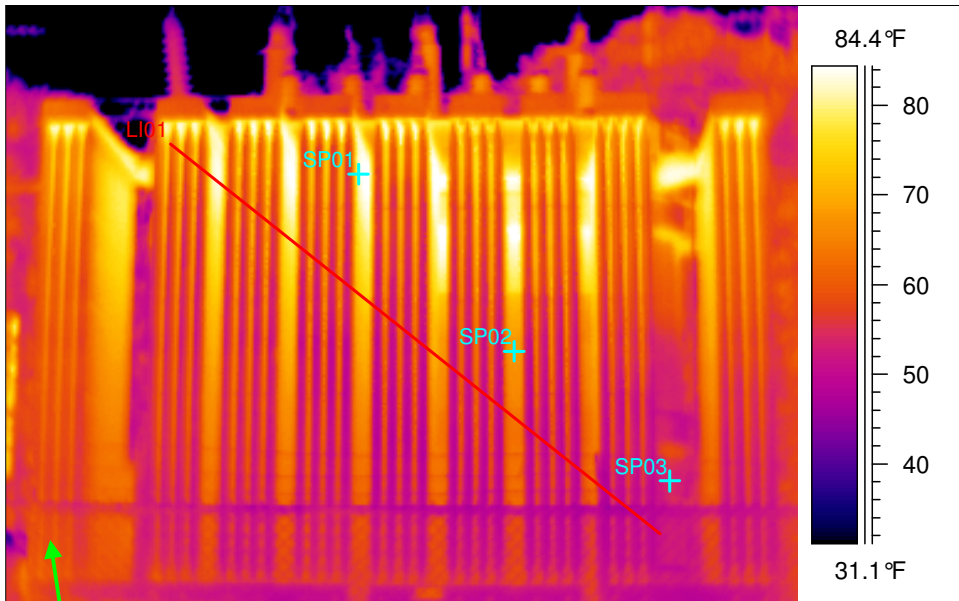
Fault	Poor connection at switch
Defect Rating	Class III

Recommendation

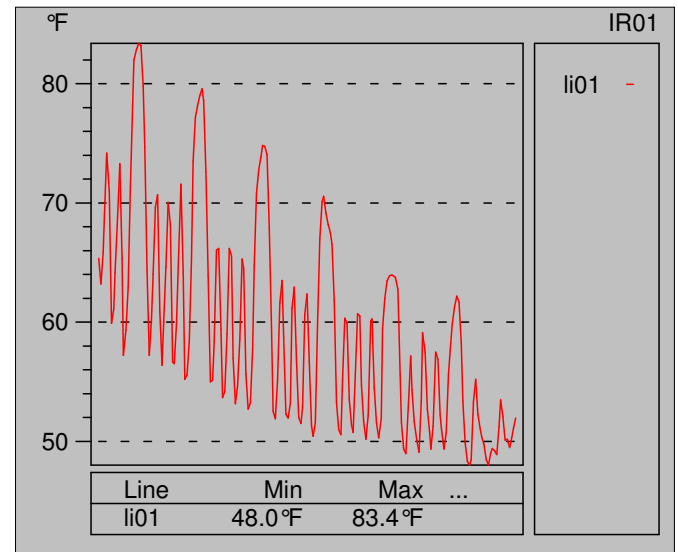
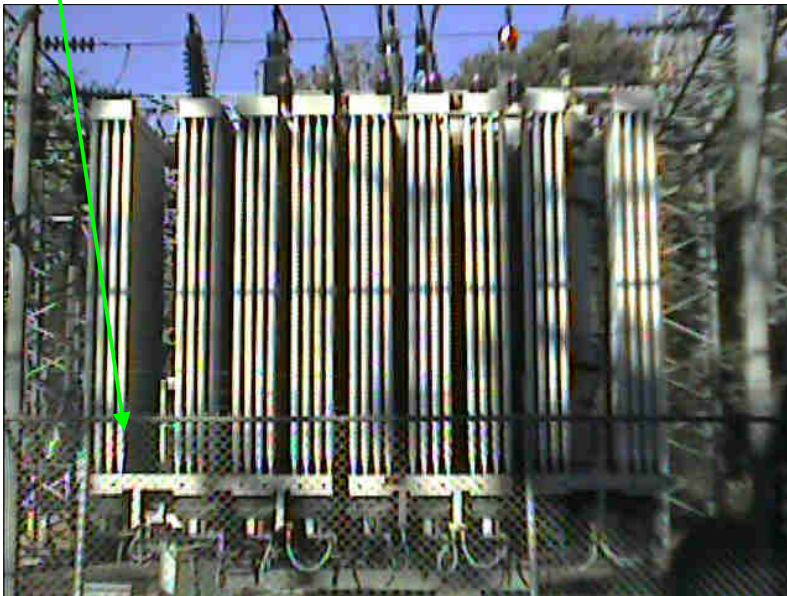
The unit should be inspected ASAP. A phase is showing a very large temperature delta compared to the other phases. Clean and inspect, repair or replace as required.



Component	Equipment/Bucket ID	Plant/Area	Date
North Transformer	4159	Main Substation 24	11-19-19



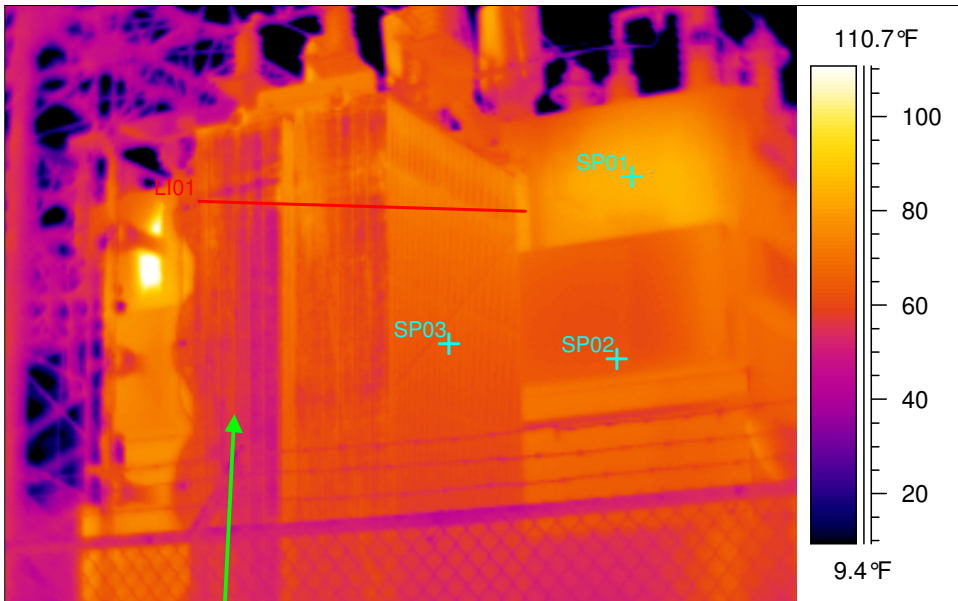
Label	Value
IR : max	87.0°F
IR : min	-13.0°F
SP01	82.8°F
SP02	68.4°F
SP03	54.2°F
LI01 : max	83.4°F
LI01 : min	48.0°F



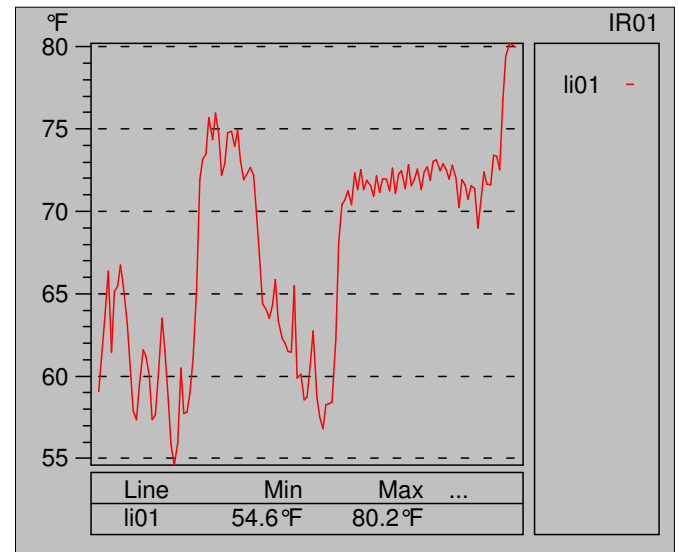
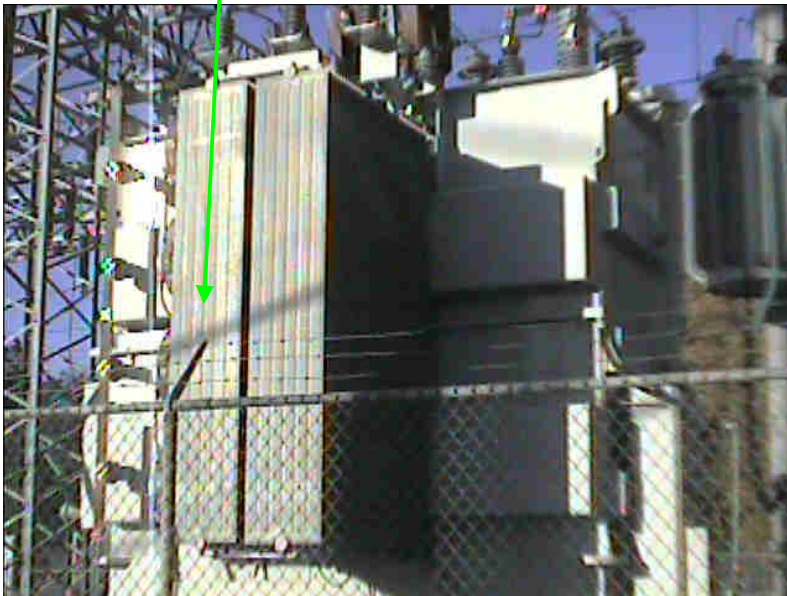
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Middle Transformer	4157	Main Substation 24	11-19-19



Label	Value
IR : max	122.6°F
IR : min	-22.2°F
SP01	84.7°F
SP02	63.1°F
SP03	64.2°F
LI01 : max	80.2°F
LI01 : min	54.6°F



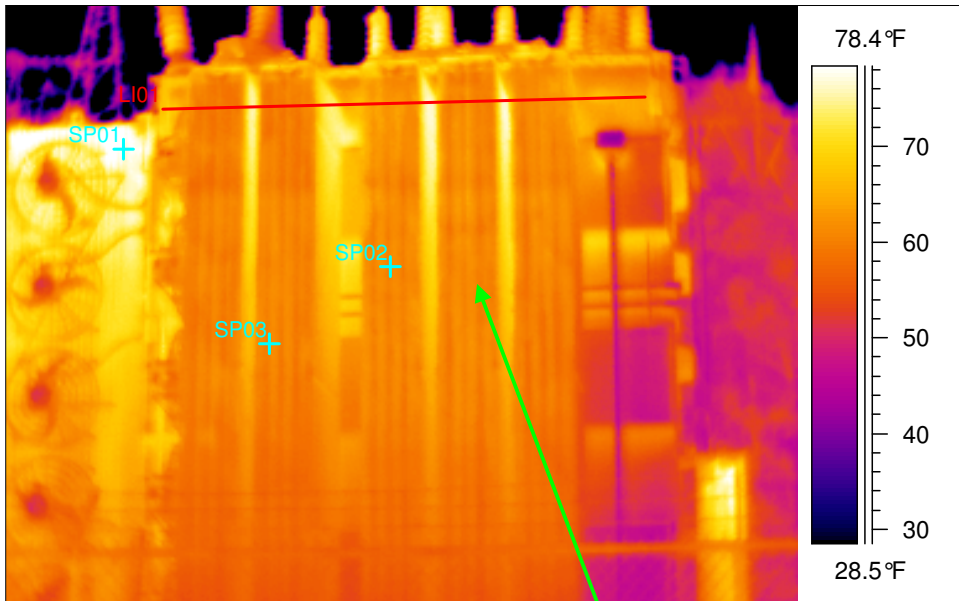
Fault	Possible cooling flow issue
Defect Rating	Class I

Recommendation

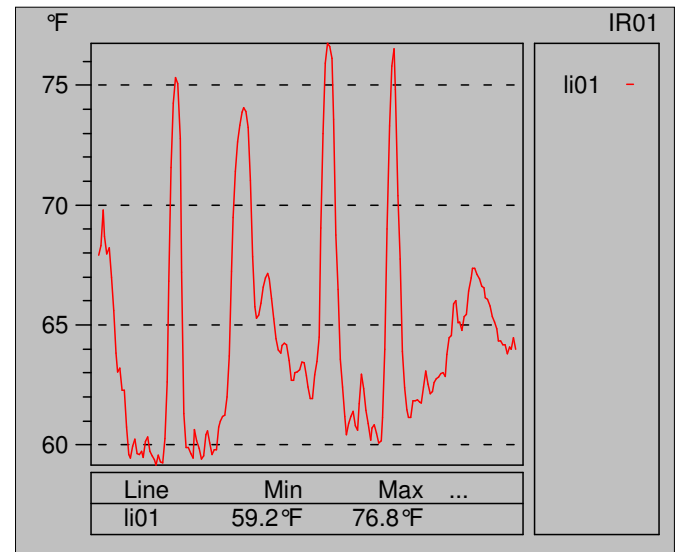
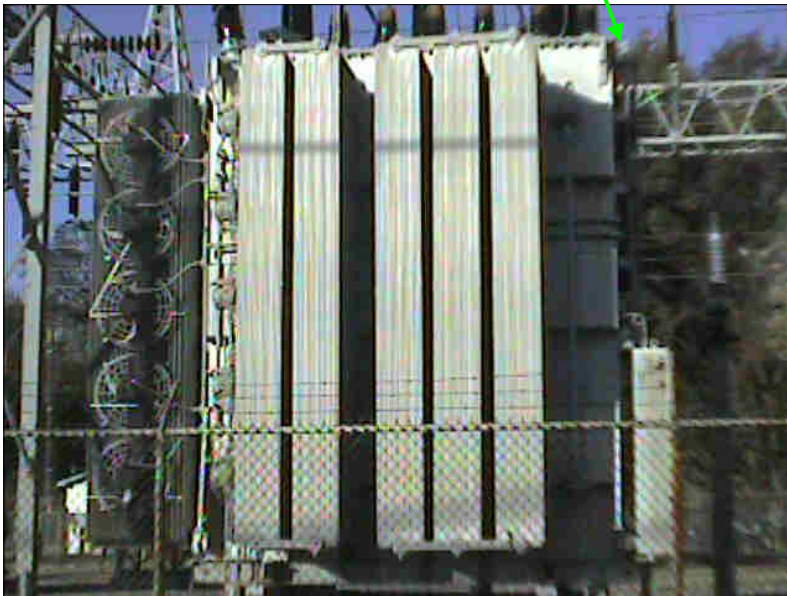
Check oil level



Component	Equipment/Bucket ID	Plant/Area	Date
South Transfrmer	4155	Main Substation 24	11-19-19



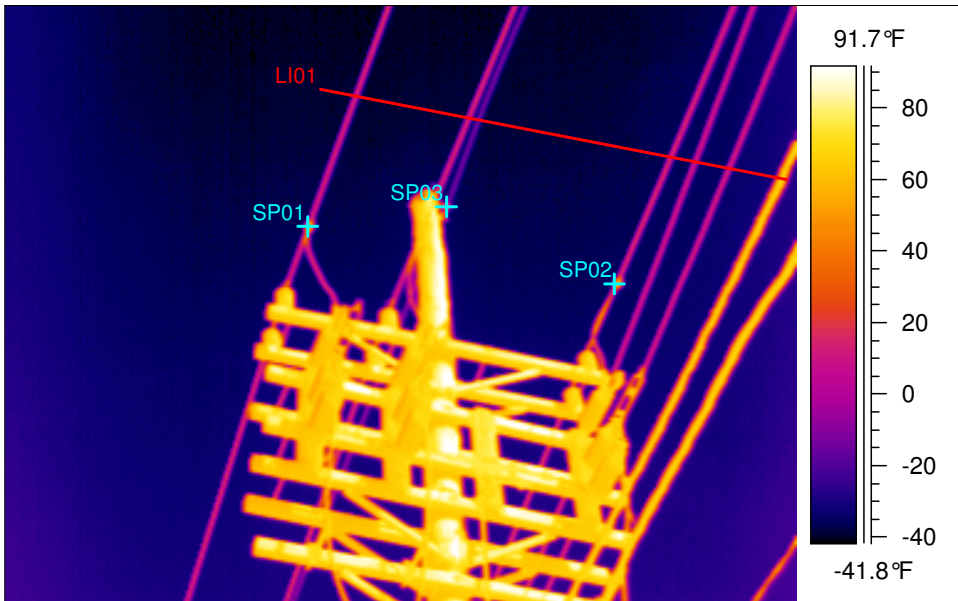
Label	Value
IR : max	81.7°F
IR : min	-18.2°F
SP01	77.8°F
SP02	61.3°F
SP03	60.6°F
LI01 : max	76.8°F
LI01 : min	59.2°F



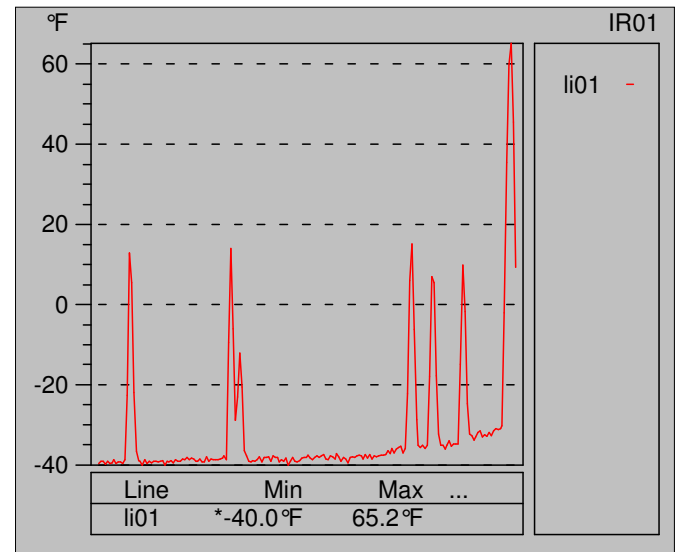
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Connection	Pole 1125	Chemours	11-19-19



Label	Value
IR : max	97.0°F
IR : min	*-42.1°F
SP01	50.9°F
SP02	37.6°F
SP03	39.9°F
LI01 : max	65.2°F
LI01 : min	*-40.0°F



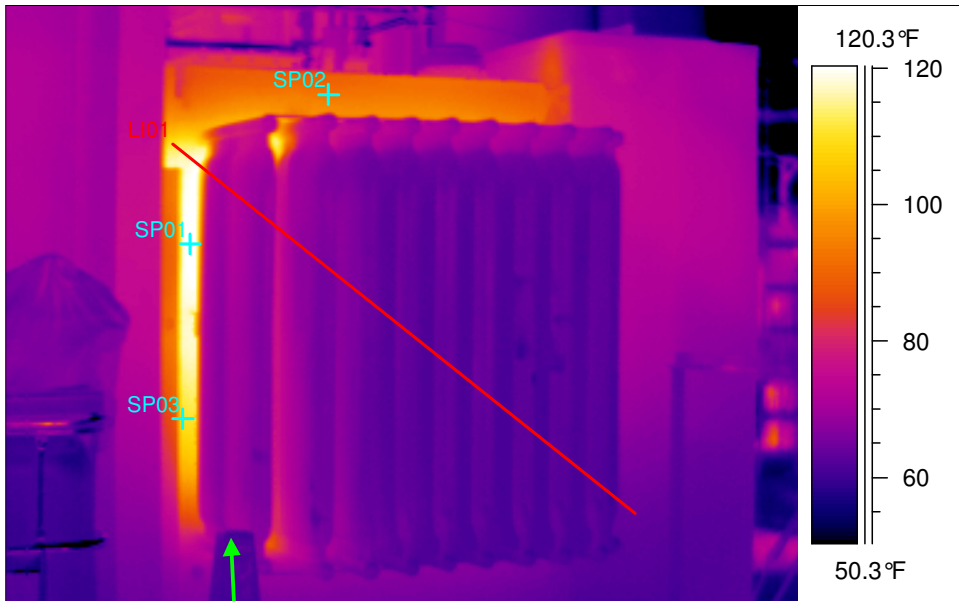
Fault	Slight connection issue
Defect Rating	Class I

Recommendation

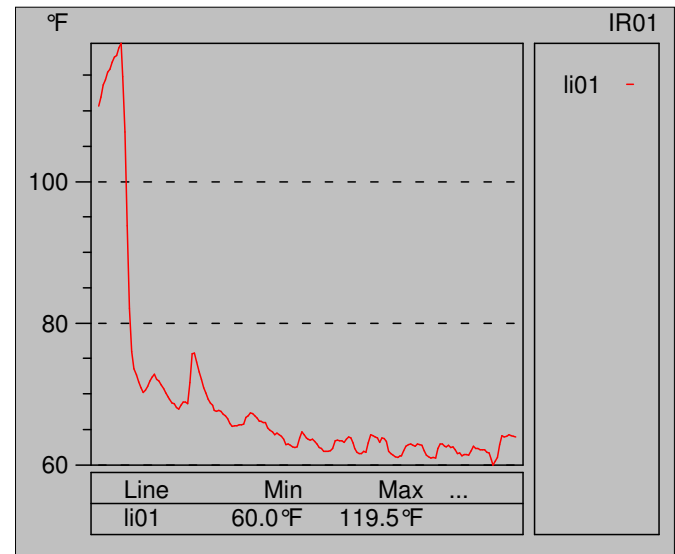
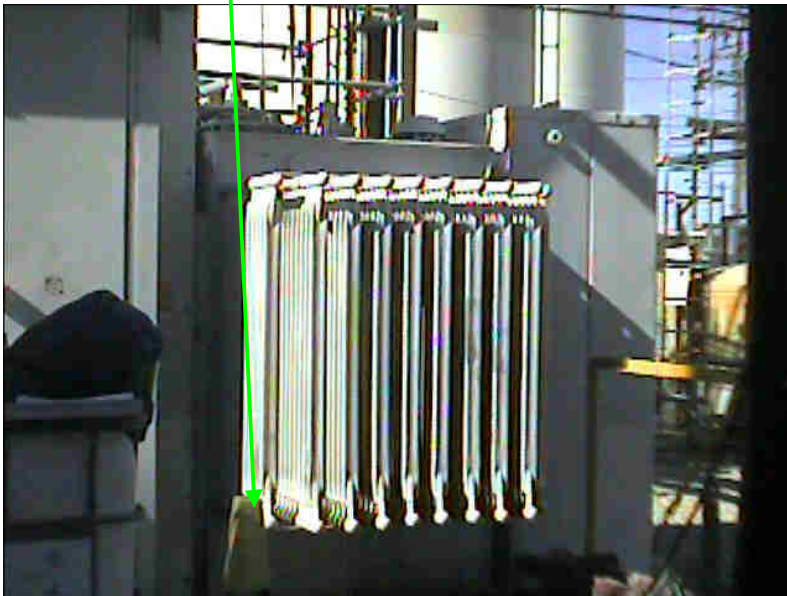
Check top Line connectors.



Component	Equipment/Bucket ID	Plant/Area	Date
East Radiator	SUB 249A	Chemours	11-19-19



Label	Value
IR : max	122.0°F
IR : min	18.9°F
SP01	121.1°F
SP02	93.0°F
SP03	110.6°F
LI01 : max	119.5°F
LI01 : min	60.0°F



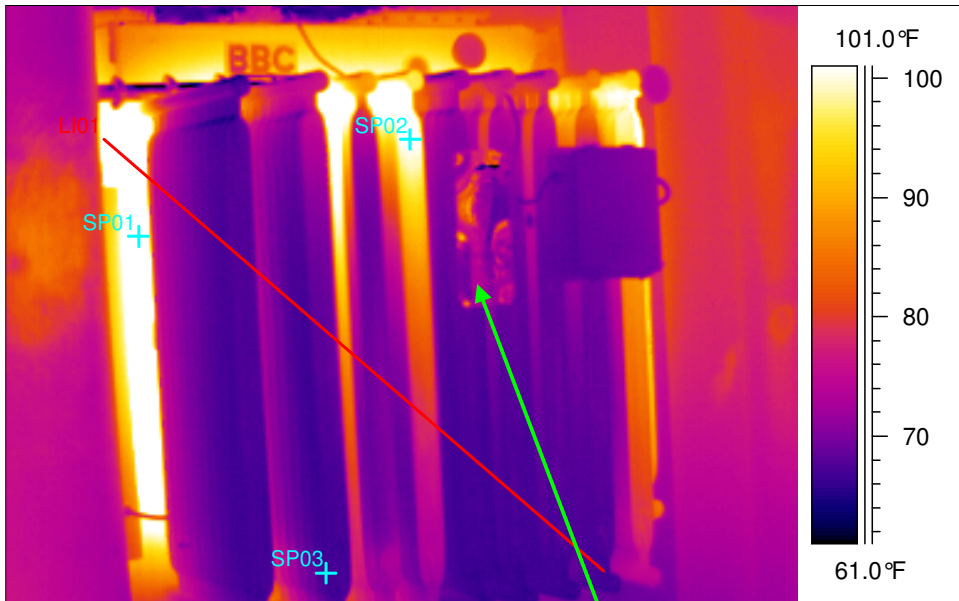
Fault	Cooling issue
Defect Rating	Class II

Recommendation

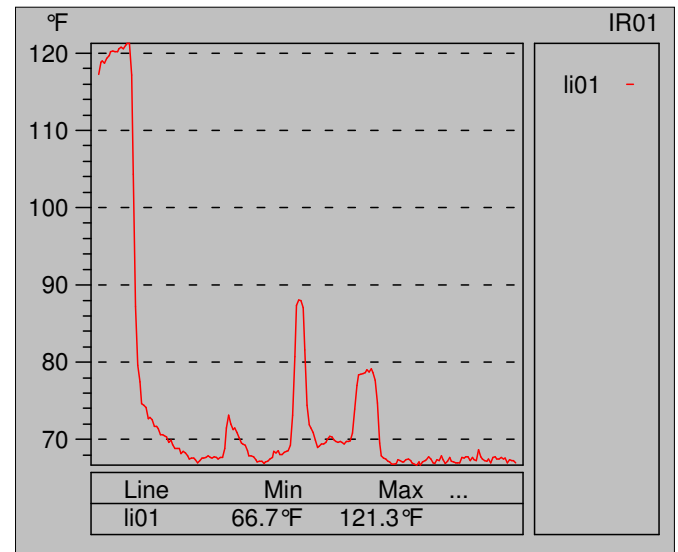
Non-working radiator. Inspect in near future. Check oil level, valves, and associated controls if equipped. Fins could be plugged.



Component	Equipment/Bucket ID	Plant/Area	Date
West Radiator	SUB 249A	Chemours	11-19-19



Label	Value
IR : max	123.0°F
IR : min	53.8°F
SP01	122.4°F
SP02	101.9°F
SP03	66.9°F
LI01 : max	121.3°F
LI01 : min	66.7°F



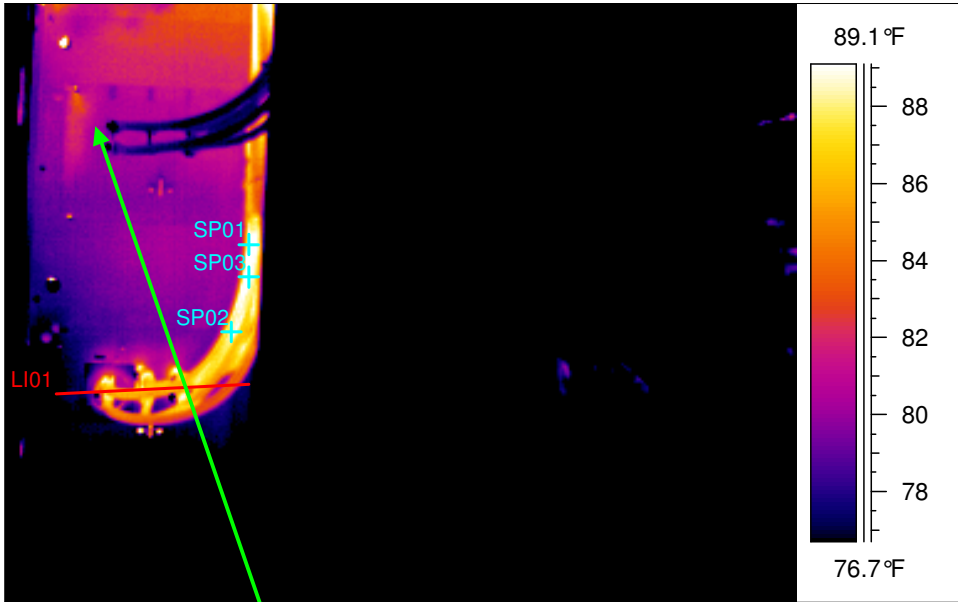
Fault	Cooling issues.
Defect Rating	Class II

Recommendation

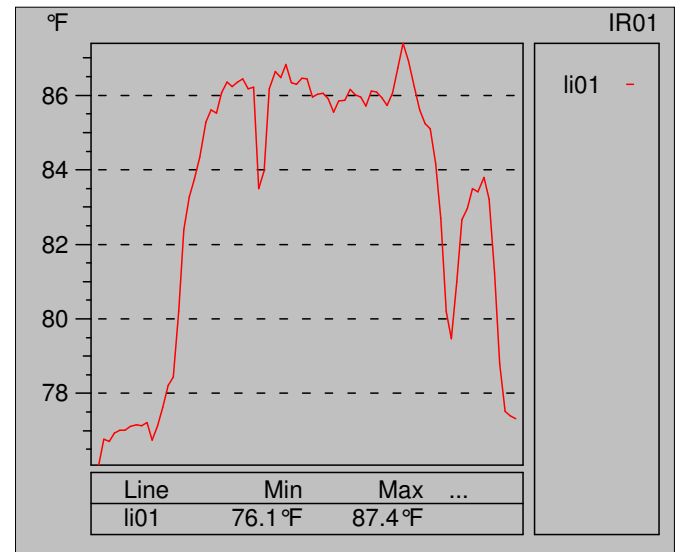
Multiple possible issues. Check for proper oil level and and plugges fins in the near future.



Component	Equipment/Bucket ID	Plant/Area	Date
Left Panel	SUB 249A	Chemours	11-19-19



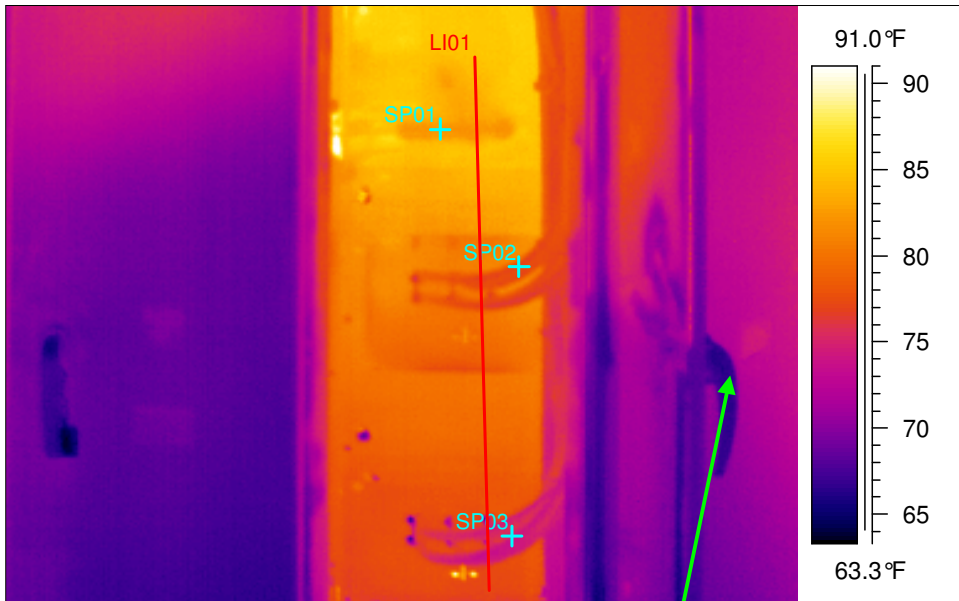
Label	Value
IR : max	111.5°F
IR : min	56.1°F
SP01	90.4°F
SP02	88.6°F
SP03	89.9°F
LI01 : max	87.4°F
LI01 : min	76.1°F



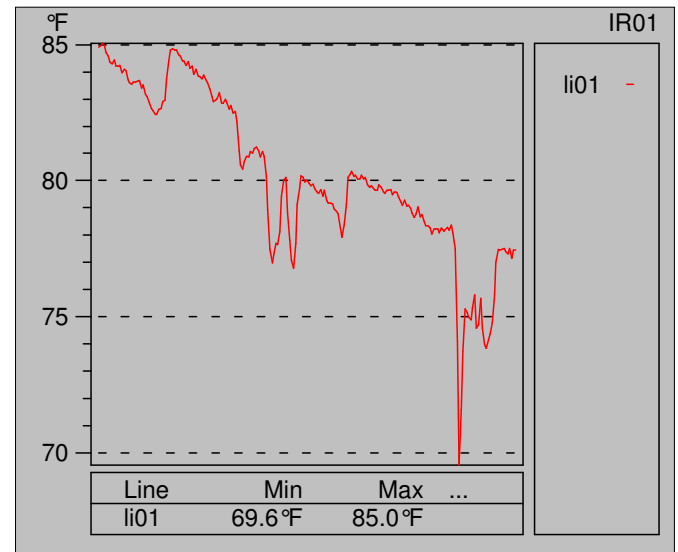
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Left Center Panel	SUB 249A	Chemours	11-19-19



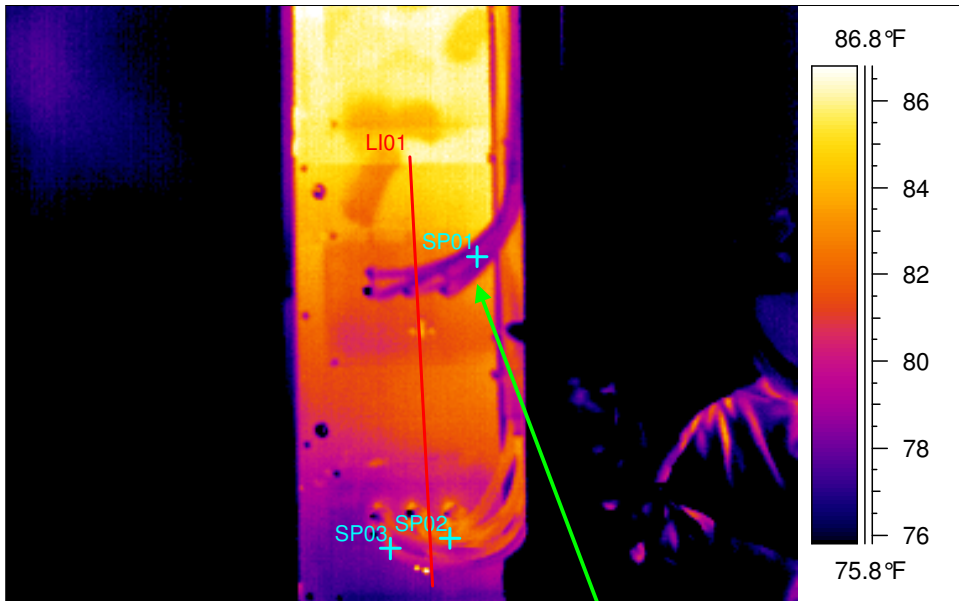
Label	Value
IR : max	92.7°F
IR : min	63.8°F
SP01	82.6°F
SP02	77.2°F
SP03	74.8°F
LI01 : max	85.0°F
LI01 : min	69.6°F



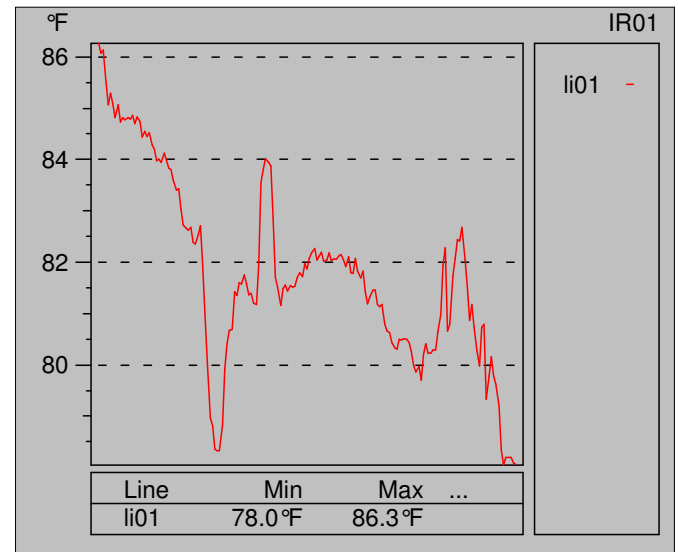
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Right Center Panel	SUB 249A	Chemours	11-19-19



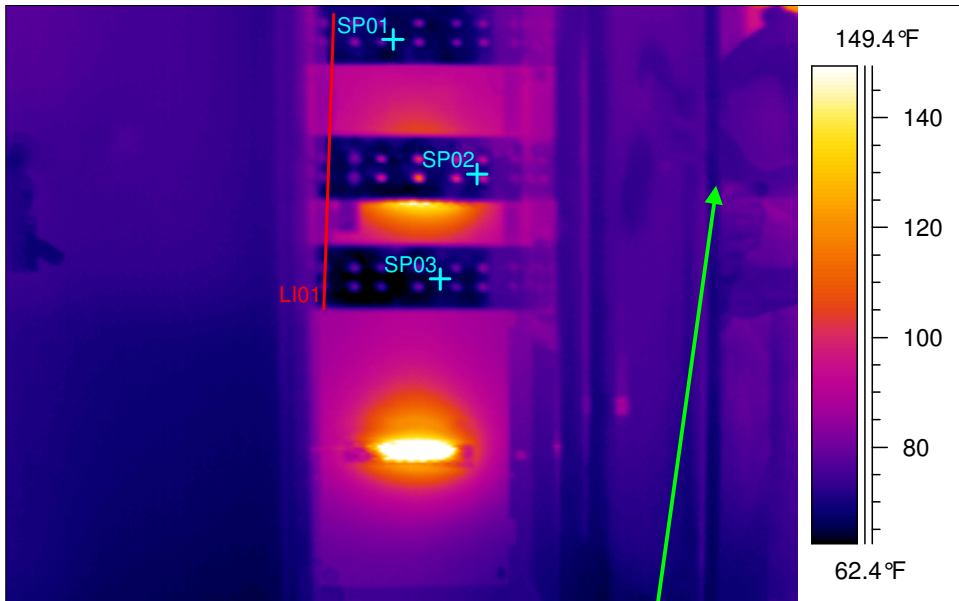
Label	Value
IR : max	90.4°F
IR : min	66.5°F
SP01	78.9°F
SP02	82.1°F
SP03	80.6°F
LI01 : max	86.3°F
LI01 : min	78.0°F



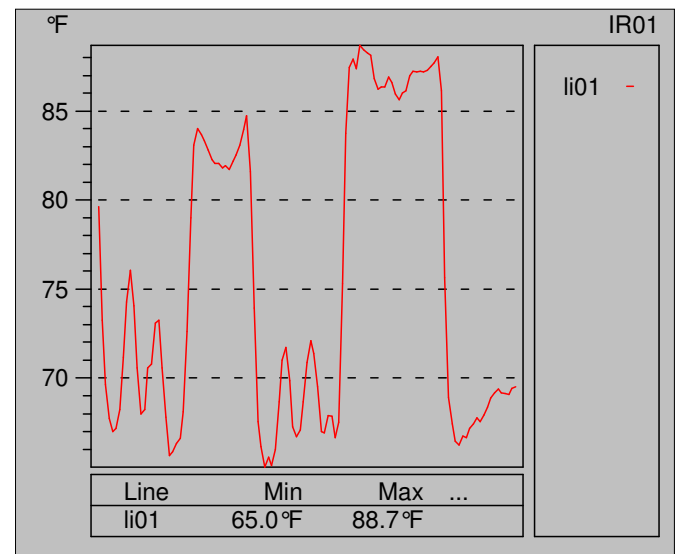
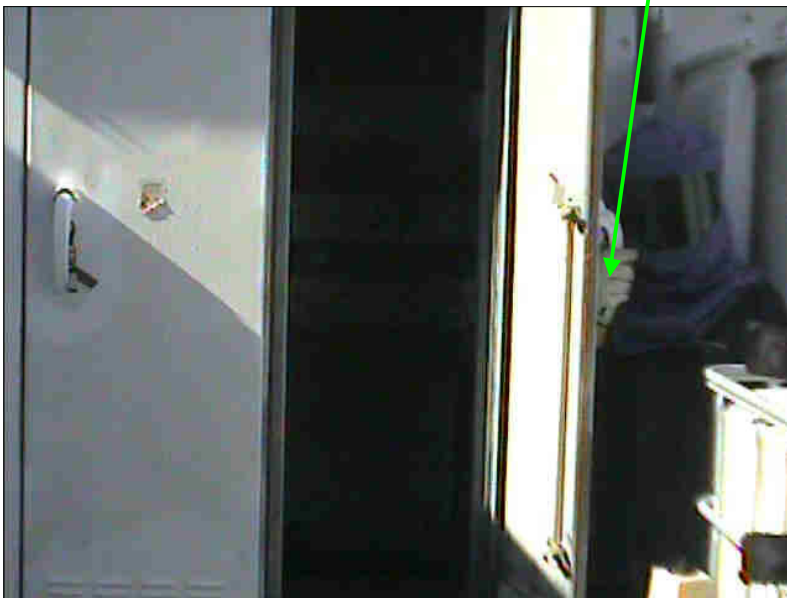
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Right Panel	SUB 249A	Chemours	11-19-19



Label	Value
IR : max	240.8°F
IR : min	60.7°F
SP01	66.0°F
SP02	72.3°F
SP03	66.2°F
LI01 : max	88.7°F
LI01 : min	65.0°F

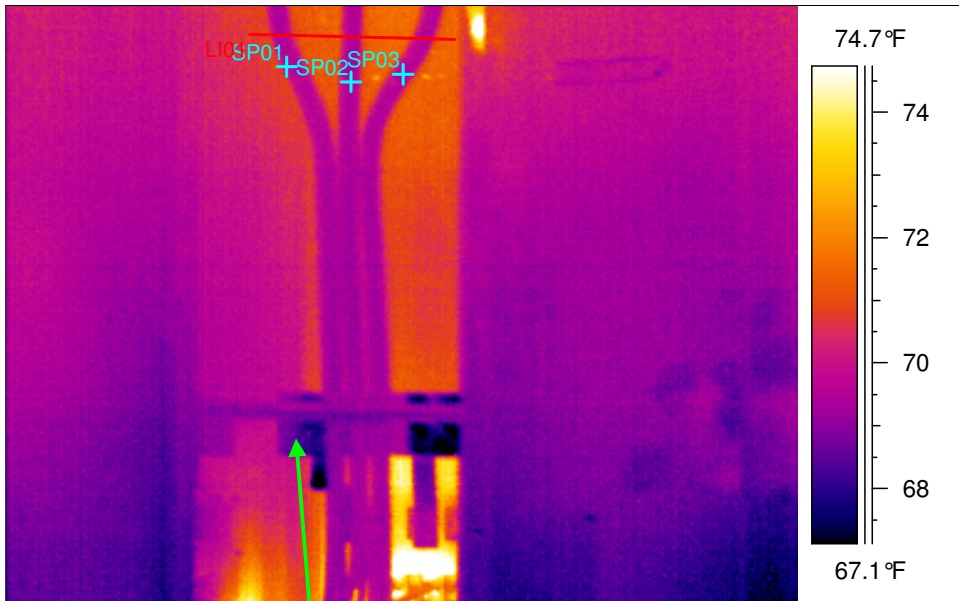


Fault	None
Defect Rating	
Recommendation	

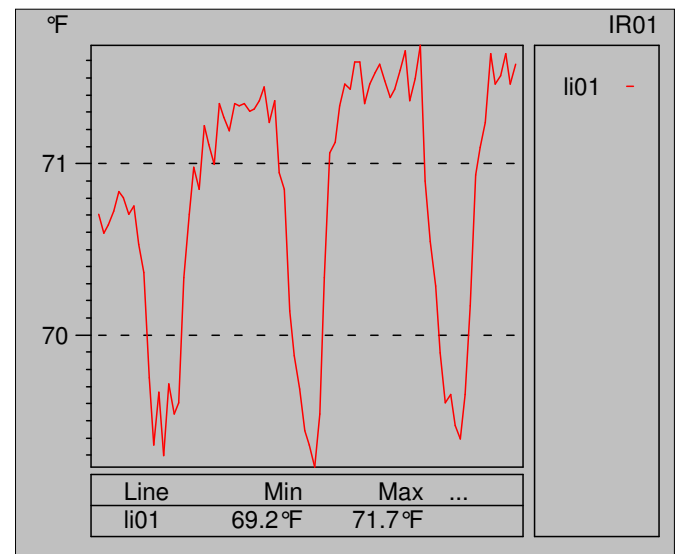
Note:
Hot spot is heater.



Component	Equipment/Bucket ID	Plant/Area	Date
Left Panel	SUB 249B	Chemours	11-19-19



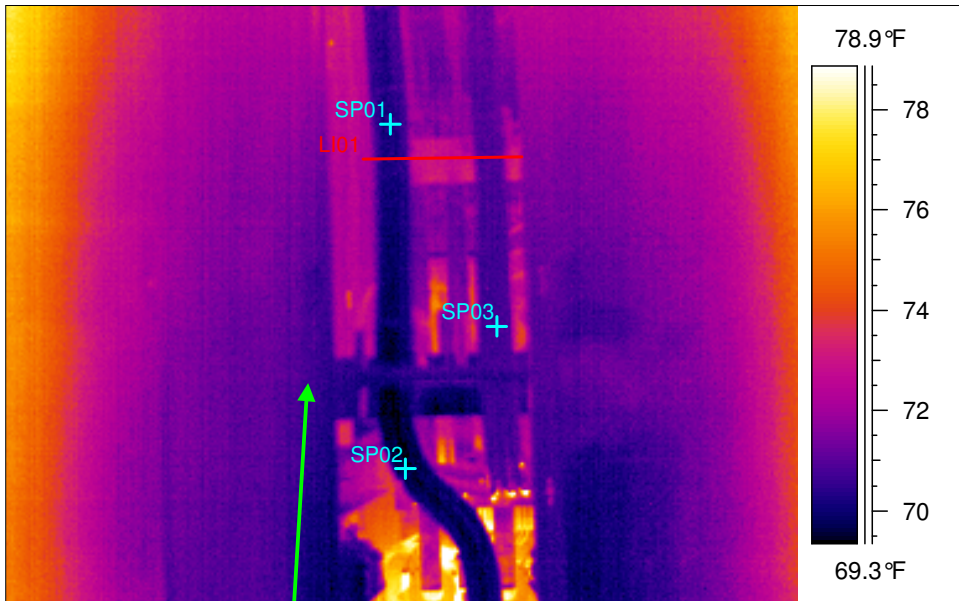
Label	Value
IR : max	77.3°F
IR : min	65.3°F
SP01	69.8°F
SP02	69.8°F
SP03	69.6°F
LI01 : max	71.7°F
LI01 : min	69.2°F



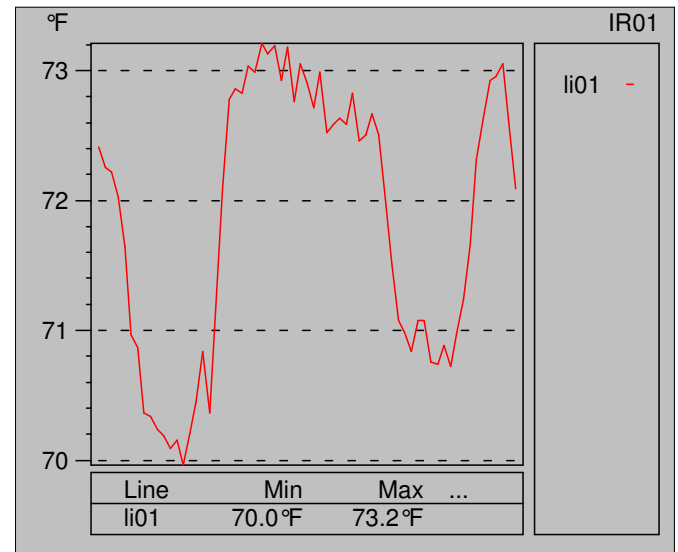
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Left Middle Panel	Sub 249 B	Chemours	11-19-19



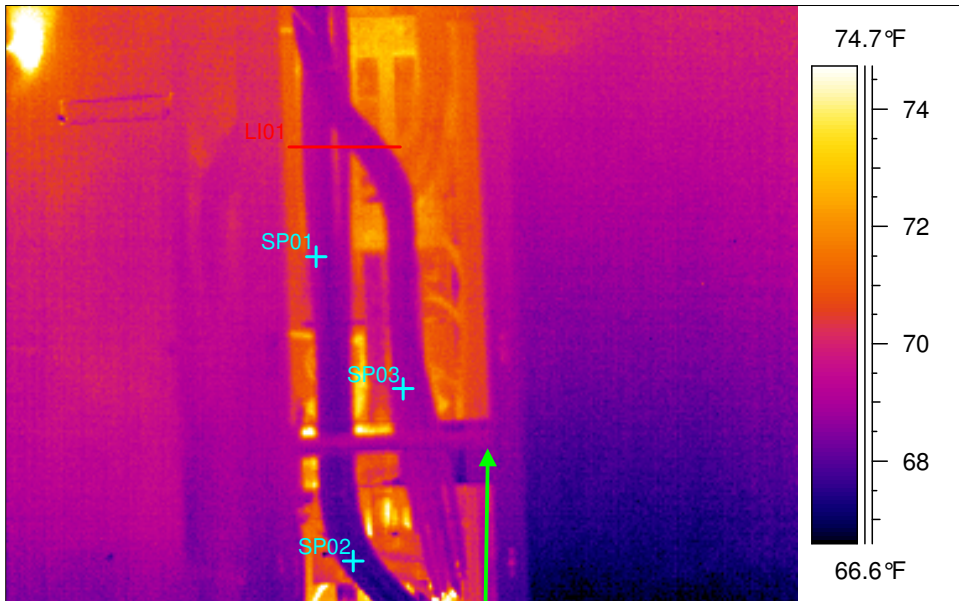
Label	Value
IR : max	88.6°F
IR : min	69.1°F
SP01	70.3°F
SP02	69.7°F
SP03	70.8°F
LI01 : max	73.2°F
LI01 : min	70.0°F



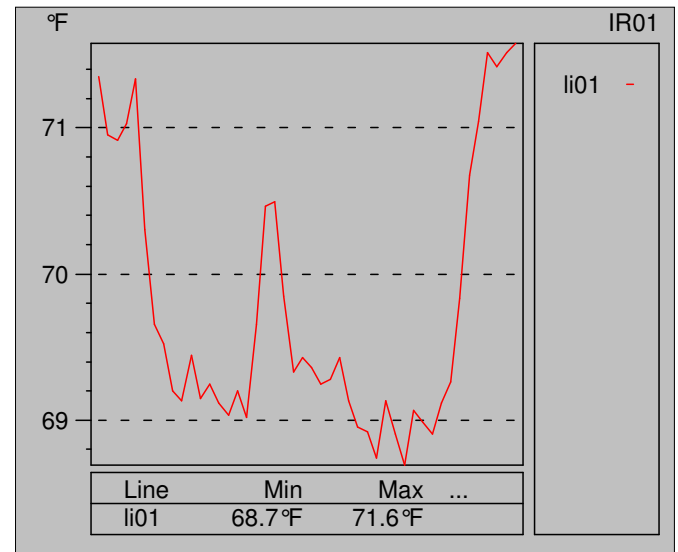
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Right Middle Panel	SUB 249 B	Chemours	11-19-19



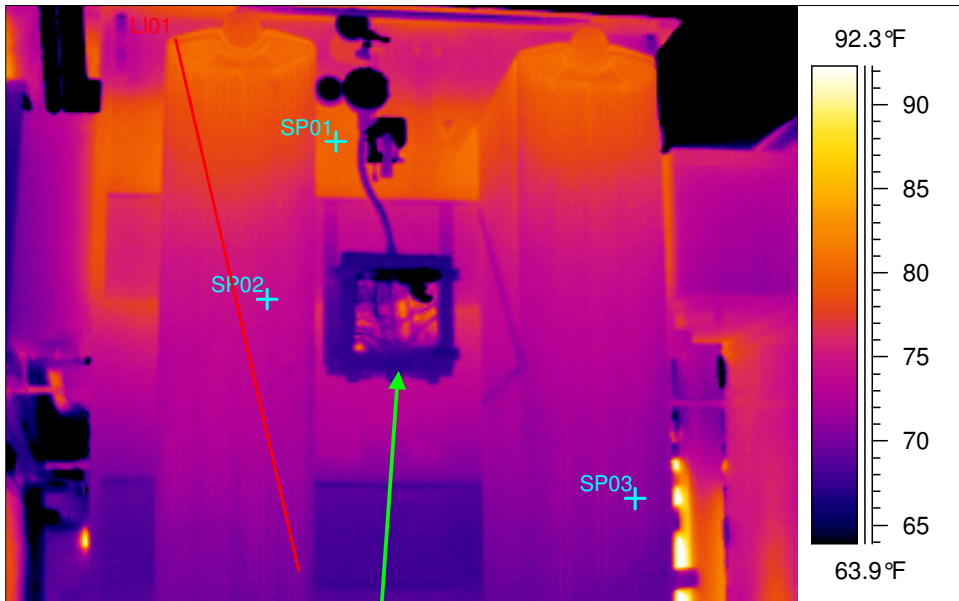
Label	Value
IR : max	82.5°F
IR : min	65.8°F
SP01	69.2°F
SP02	67.6°F
SP03	69.0°F
LI01 : max	71.6°F
LI01 : min	68.7°F



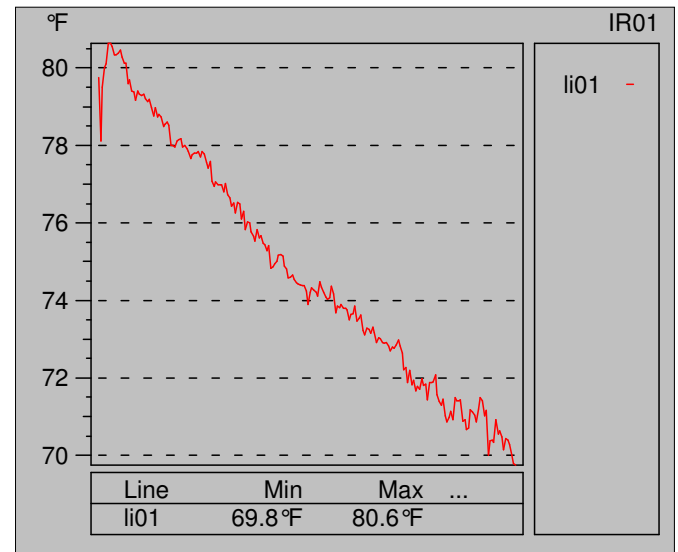
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
North Radiator	SUB 249B	Chemours	11-19-19



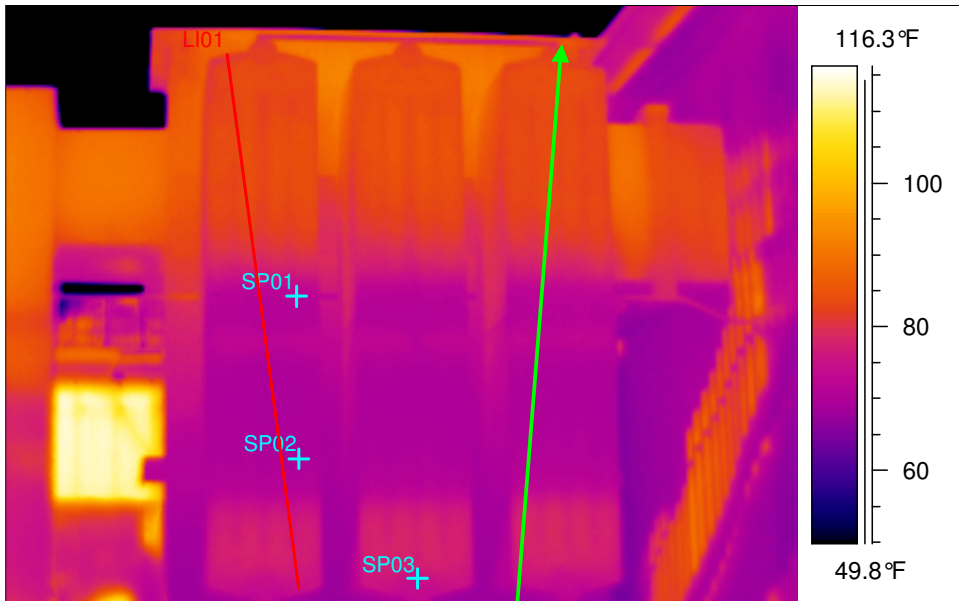
Label	Value
IR : max	97.7°F
IR : min	-18.2°F
SP01	79.8°F
SP02	74.5°F
SP03	71.1°F
LI01 : max	80.6°F
LI01 : min	69.8°F



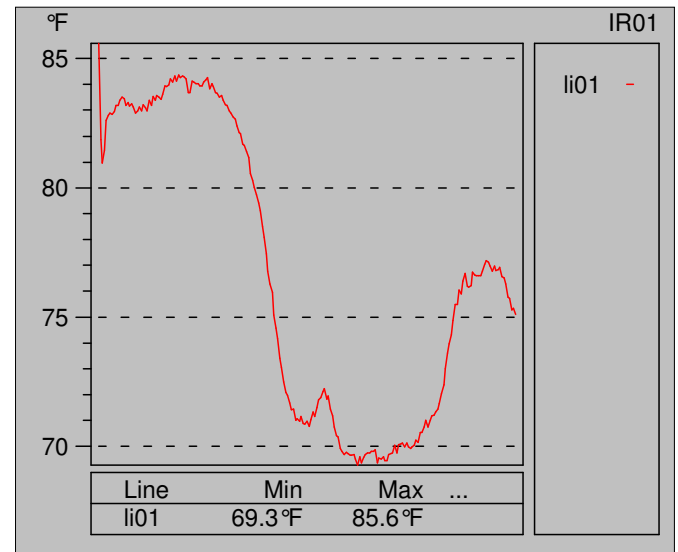
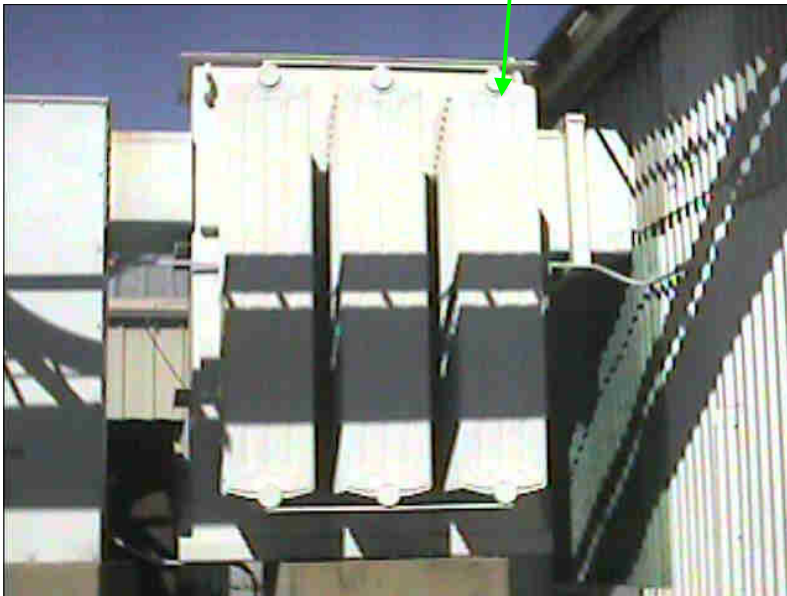
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
South Radiator	SUB 249B	Chemours	11-19-19



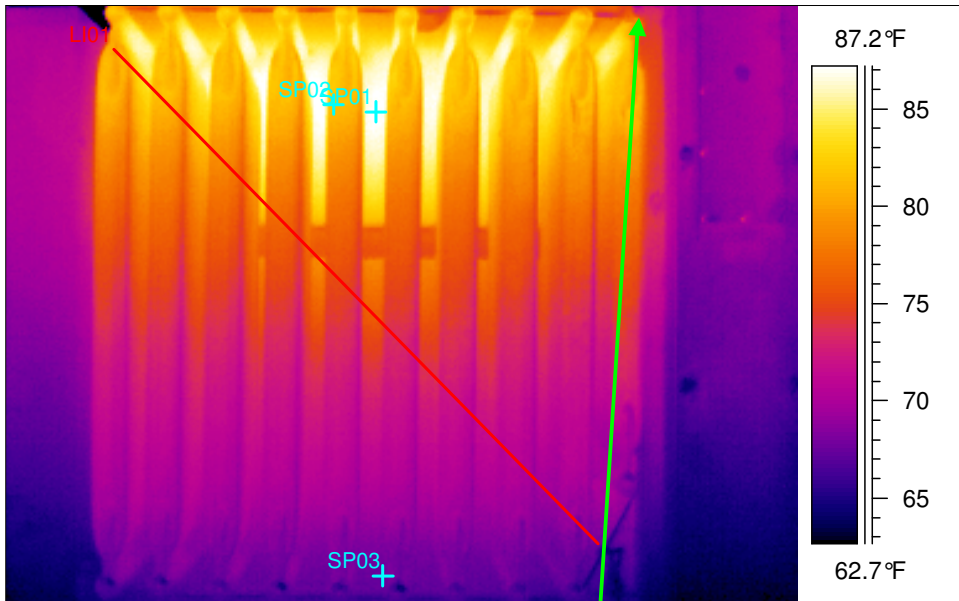
Label	Value
IR : max	114.5°F
IR : min	-19.8°F
SP01	72.0°F
SP02	69.7°F
SP03	75.1°F
LI01 : max	85.6°F
LI01 : min	69.3°F



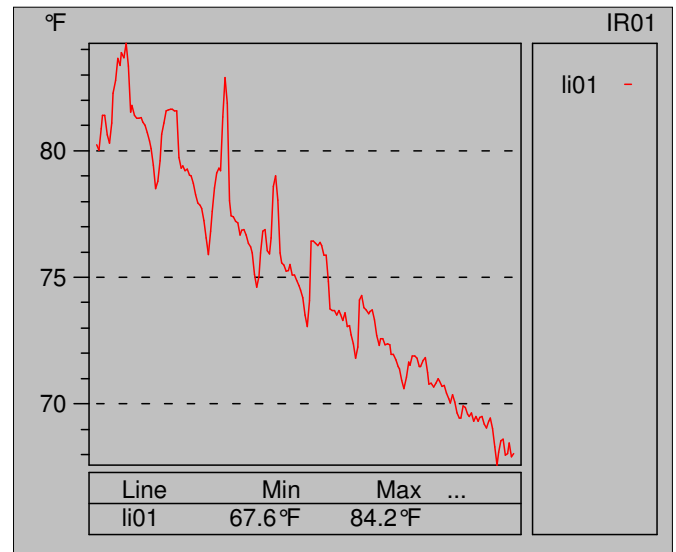
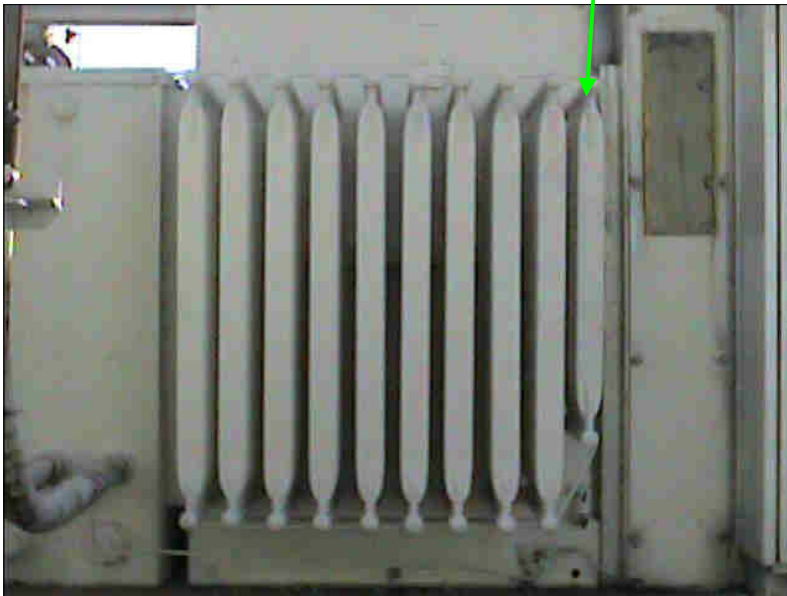
Fault	None.
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
North Radiator	SUB 249C	Chemours	11-19-19



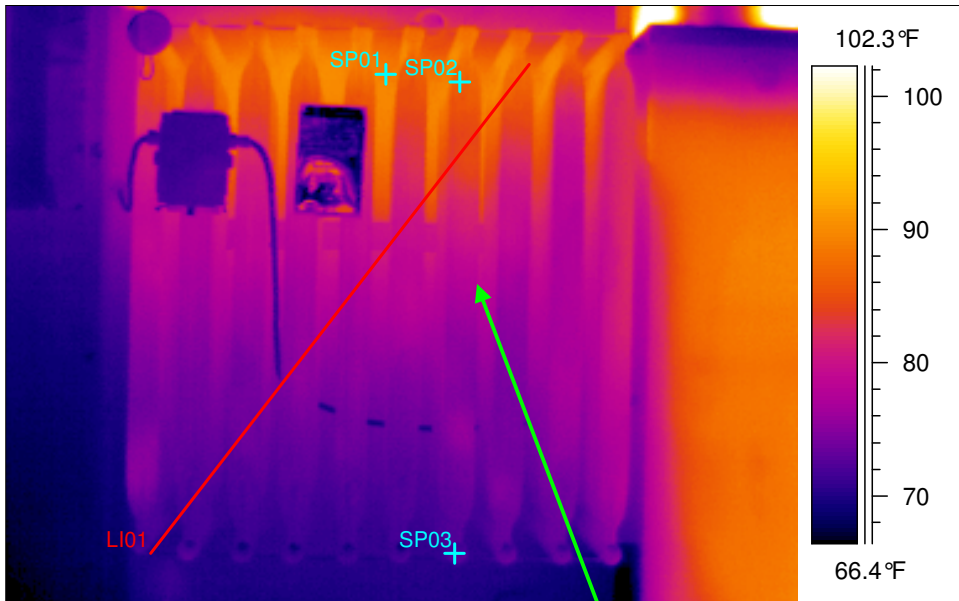
Label	Value
IR : max	87.7°F
IR : min	10.7°F
SP01	87.2°F
SP02	81.9°F
SP03	67.6°F
LI01 : max	84.2°F
LI01 : min	67.6°F



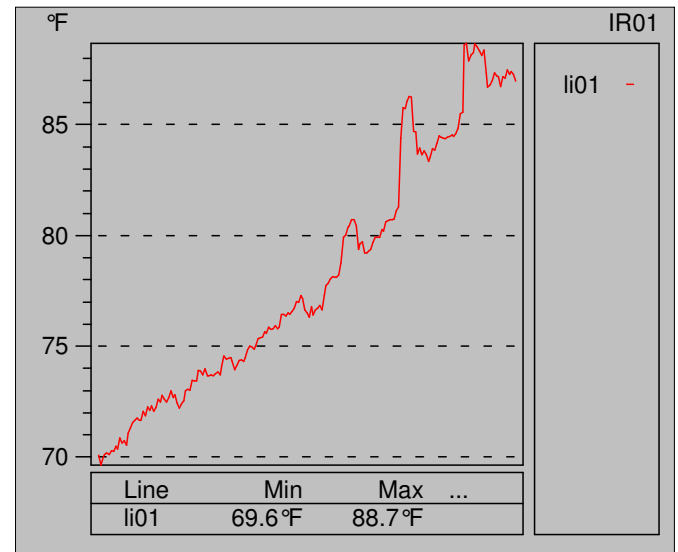
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
South Radiator	SUB 249C	Chemours	11-19-19



Label	Value
IR : max	113.9°F
IR : min	64.2°F
SP01	89.0°F
SP02	86.7°F
SP03	72.1°F
LI01 : max	88.7°F
LI01 : min	69.6°F



Fault	Slight variation in cooling fins
Defect Rating	none

Recommendation

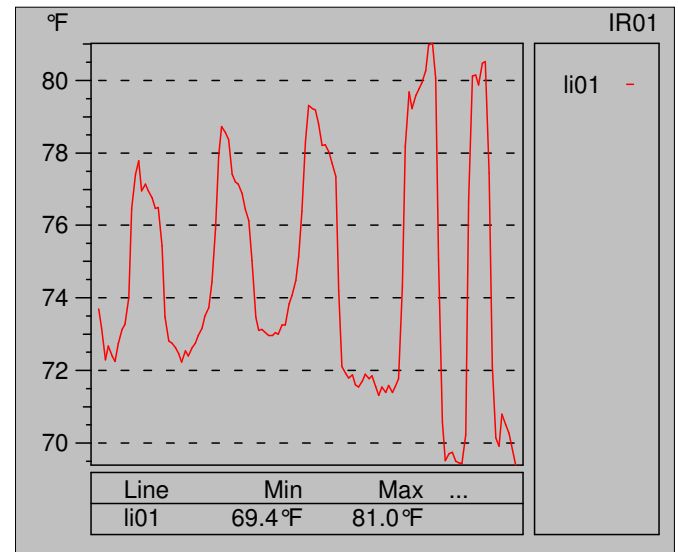
Check oil level for now.



Component	Equipment/Bucket ID	Plant/Area	Date
Left Panel	SUB 249C	Chemours	11-19-19



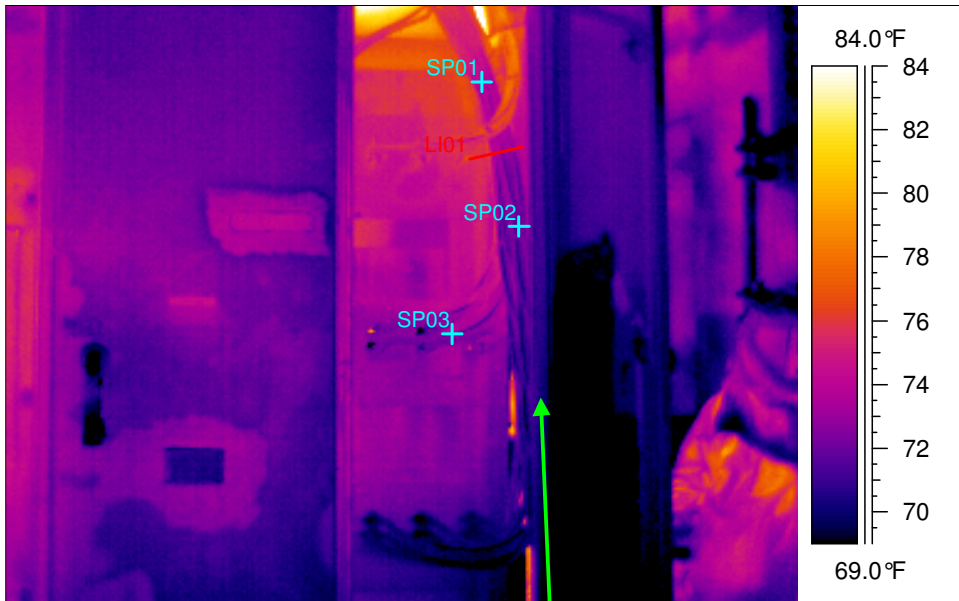
Label	Value
IR : max	86.4°F
IR : min	52.3°F
SP01	85.0°F
SP02	78.1°F
SP03	79.2°F
LI01 : max	81.0°F
LI01 : min	69.4°F



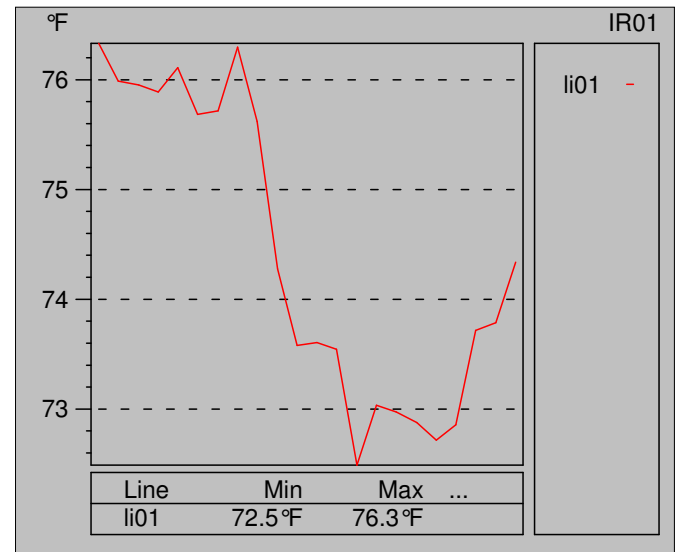
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Right Panel	SUB 249C	Chemours	11-19-19



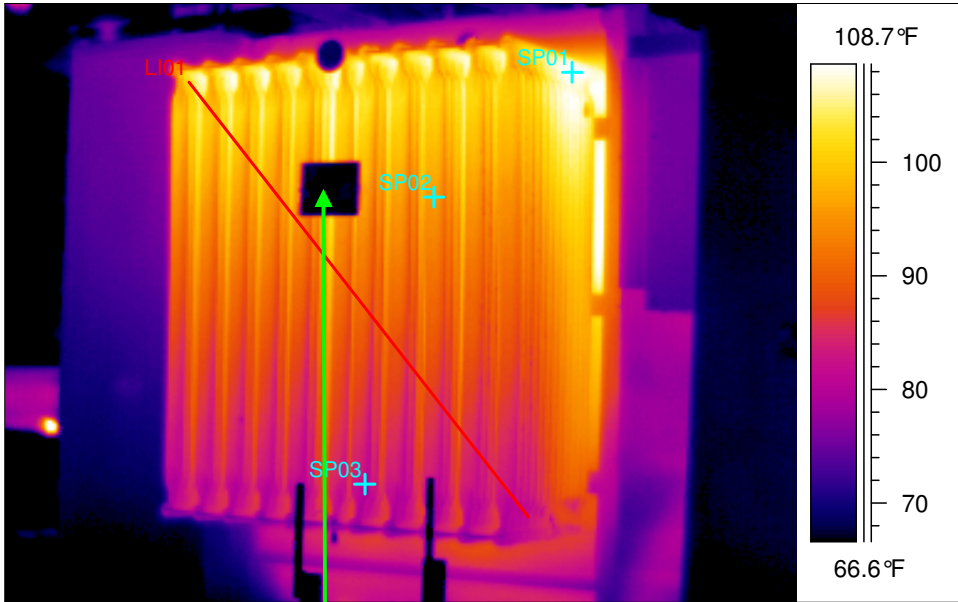
Label	Value
IR : max	91.6°F
IR : min	47.3°F
SP01	74.4°F
SP02	71.6°F
SP03	72.4°F
LI01 : max	76.3°F
LI01 : min	72.5°F



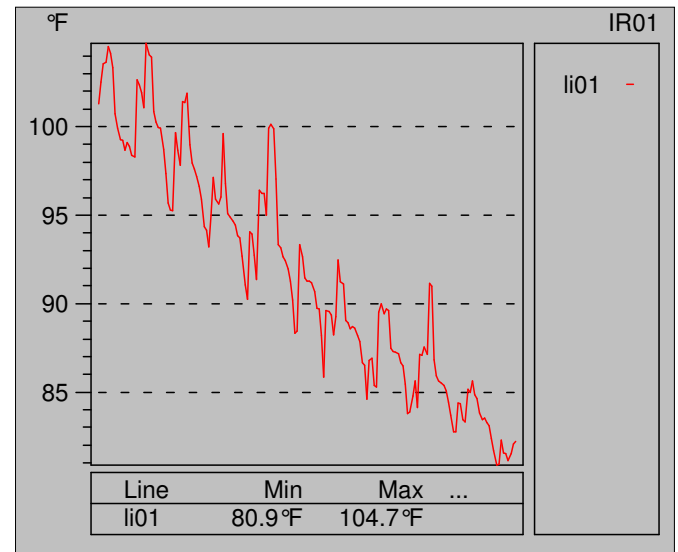
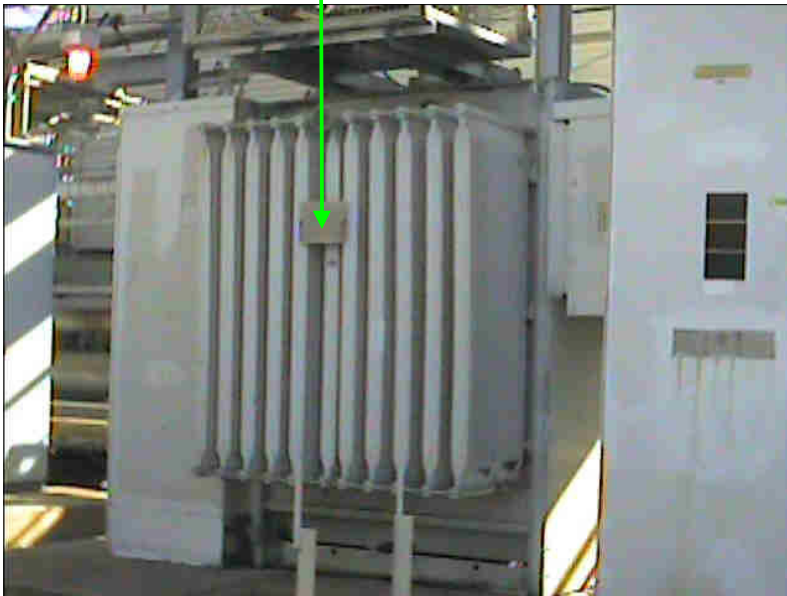
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
North Radiator	SUB 249D	Chemours	11-19-19



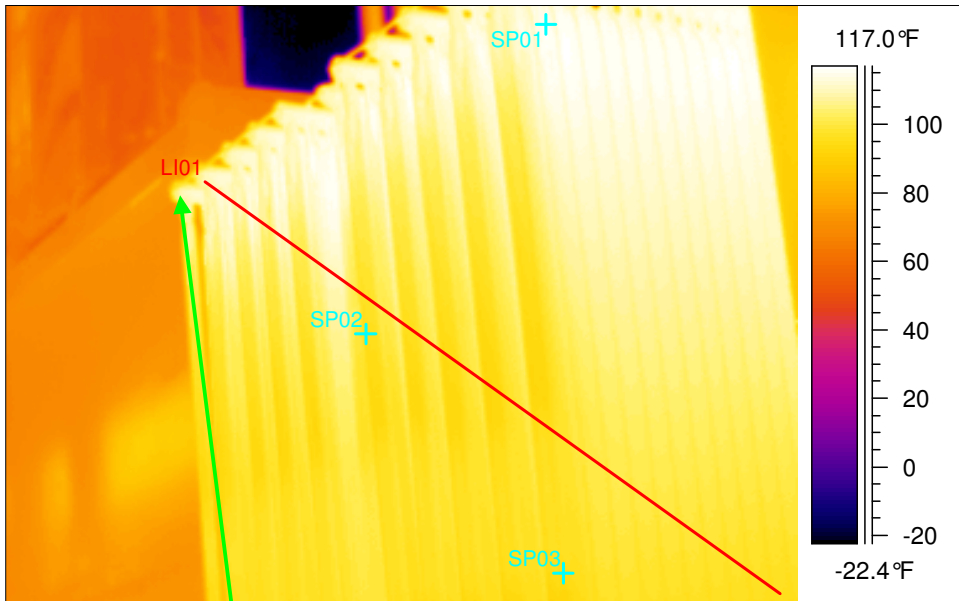
Label	Value
IR : max	115.9°F
IR : min	52.8°F
SP01	109.2°F
SP02	96.4°F
SP03	81.7°F
LI01 : max	104.7°F
LI01 : min	80.9°F



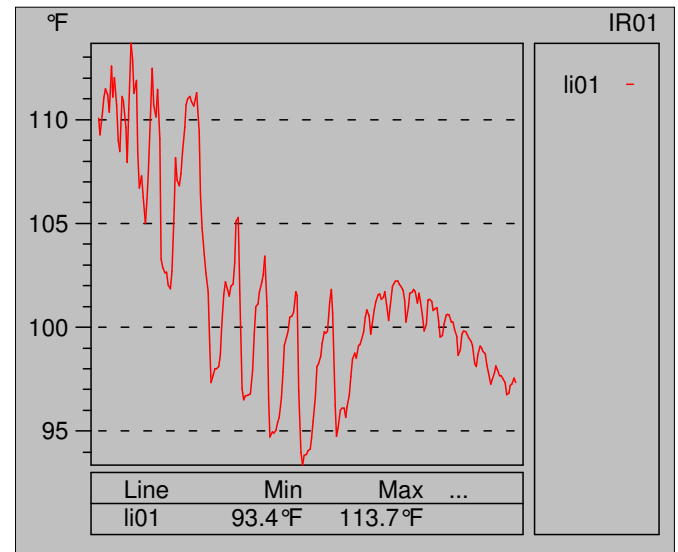
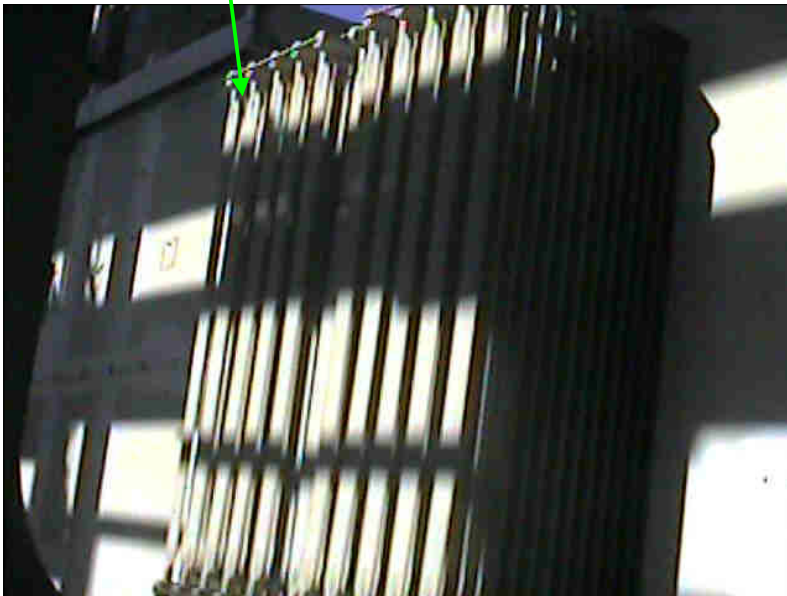
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
South Radiator	SUB 249D	Chemours	11-19-19



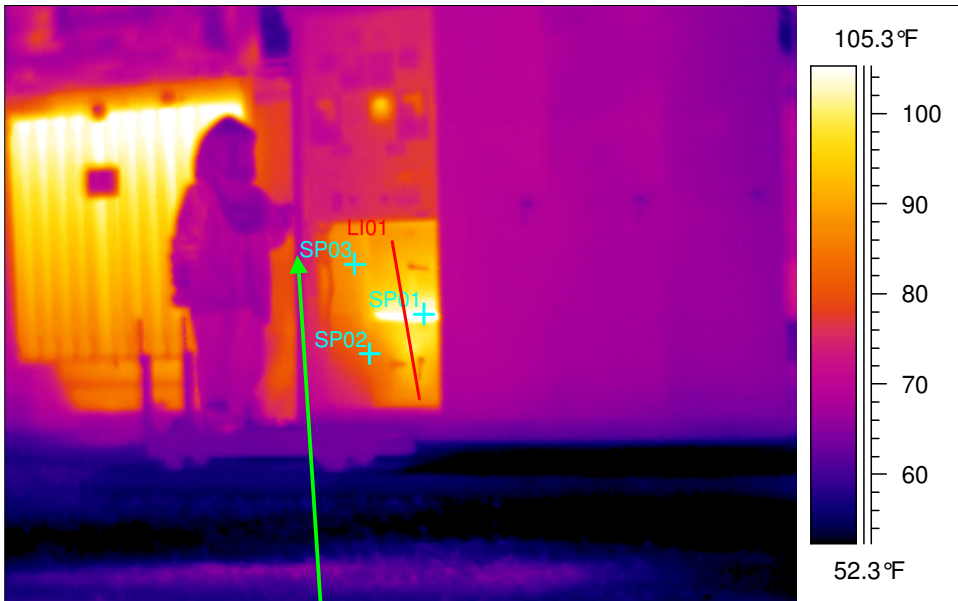
Label	Value
IR : max	117.7°F
IR : min	-25.4°F
SP01	116.0°F
SP02	96.0°F
SP03	95.4°F
LI01 : max	113.7°F
LI01 : min	93.4°F



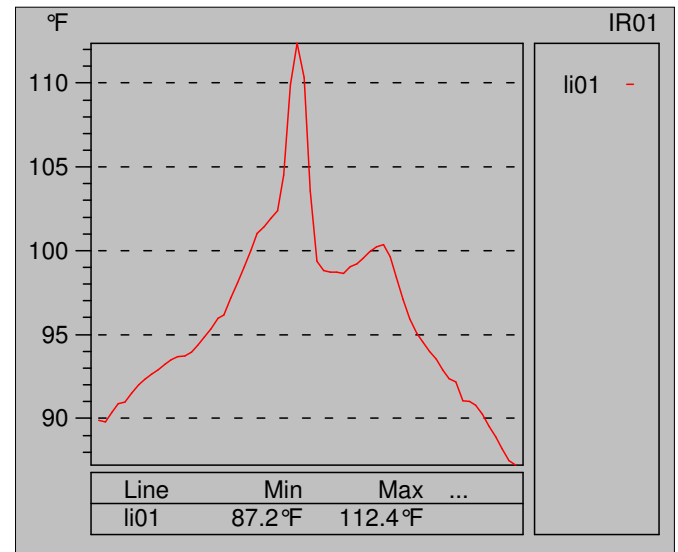
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Left Panel	SUB 249D	Chemours	11-19-19



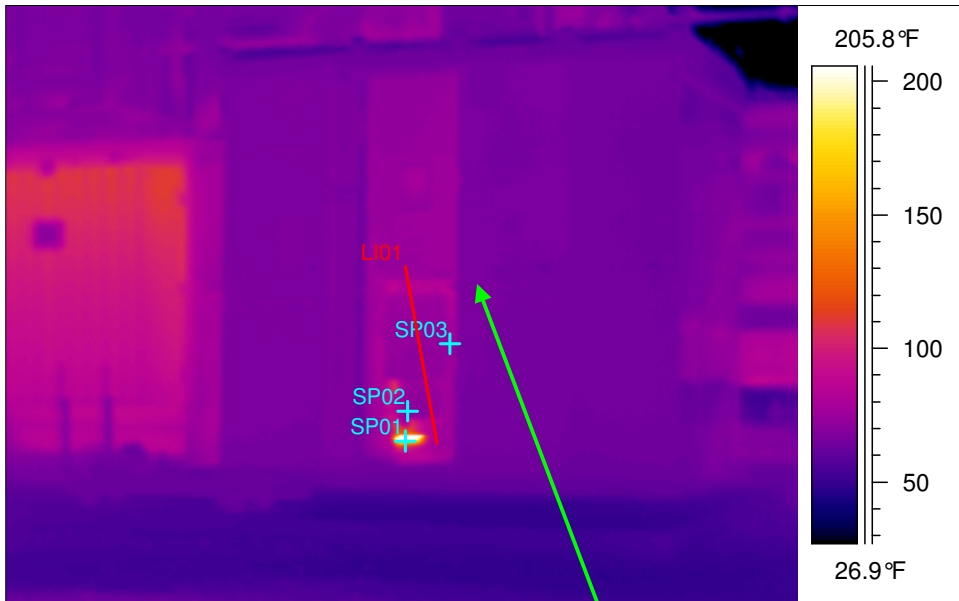
Label	Value
IR : max	116.1°F
IR : min	48.4°F
SP01	113.8°F
SP02	84.4°F
SP03	89.3°F
LI01 : max	112.4°F
LI01 : min	87.2°F



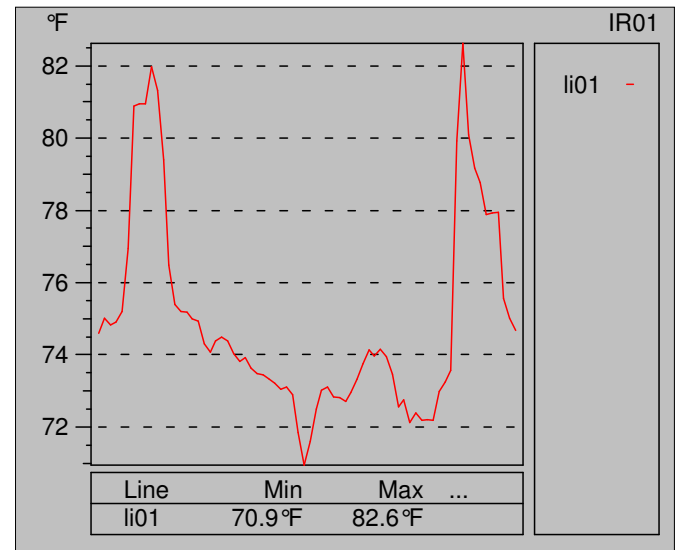
Fault	None
Defect Rating	
Recommendation	



Component	Equipment/Bucket ID	Plant/Area	Date
Left Center Panel	SUB 249D	Chemours	11-19-19



Label	Value
IR : max	*282.2°F
IR : min	11.2°F
SP01	181.1°F
SP02	73.1°F
SP03	75.8°F
LI01 : max	82.6°F
LI01 : min	70.9°F



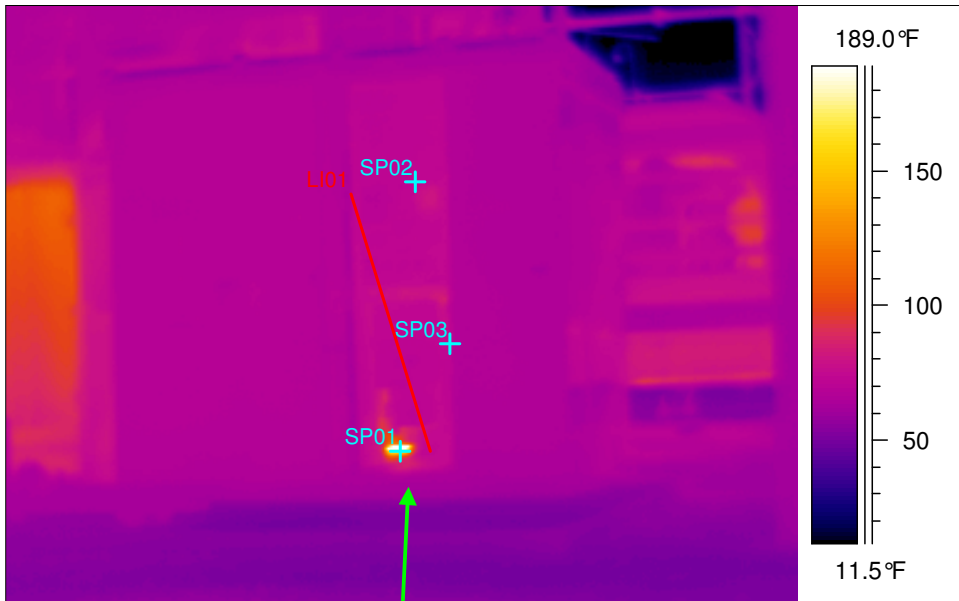
Fault	None
Defect Rating	

Recommendation

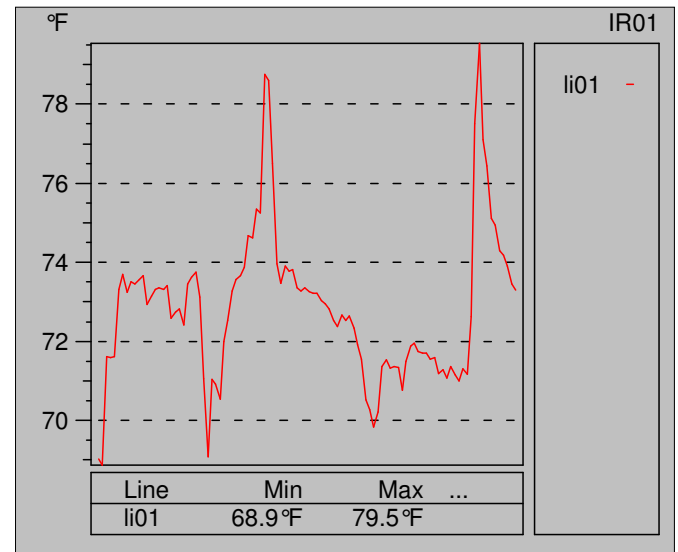
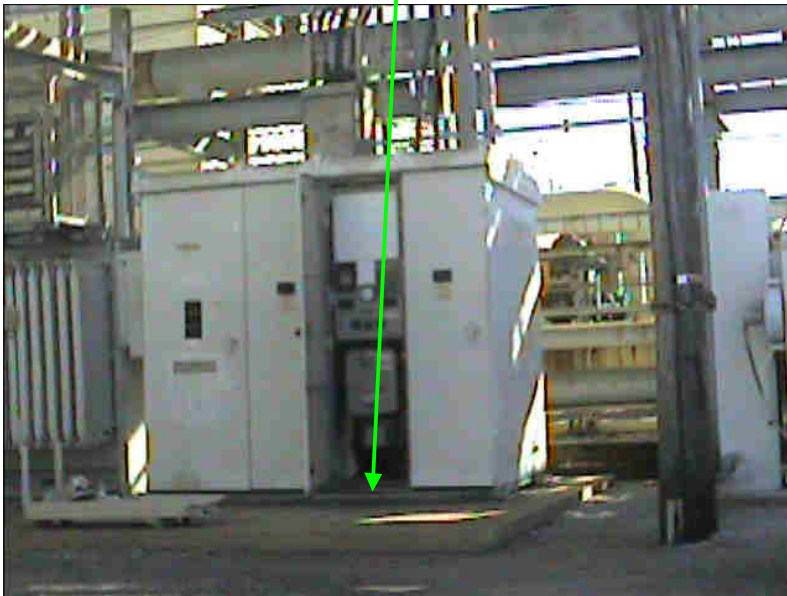
Heater is the hot spot



Component	Equipment/Bucket ID	Plant/Area	Date
Right Center Panel	SUB 249D	Chemours	11-19-19



Label	Value
IR : max	237.7°F
IR : min	8.9°F
SP01	170.1°F
SP02	72.8°F
SP03	72.4°F
LI01 : max	79.5°F
LI01 : min	68.9°F



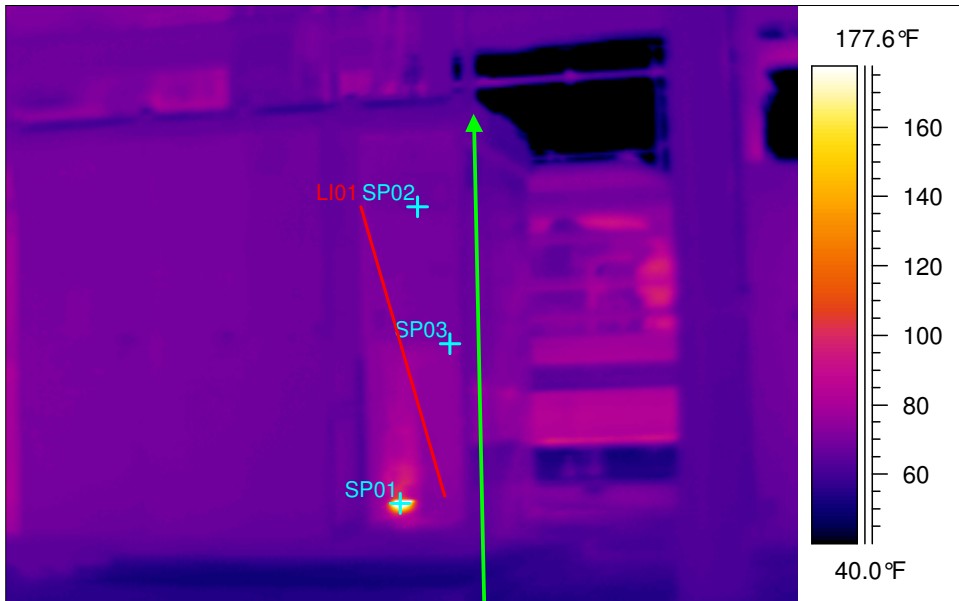
Fault	None
Defect Rating	

Recommendation

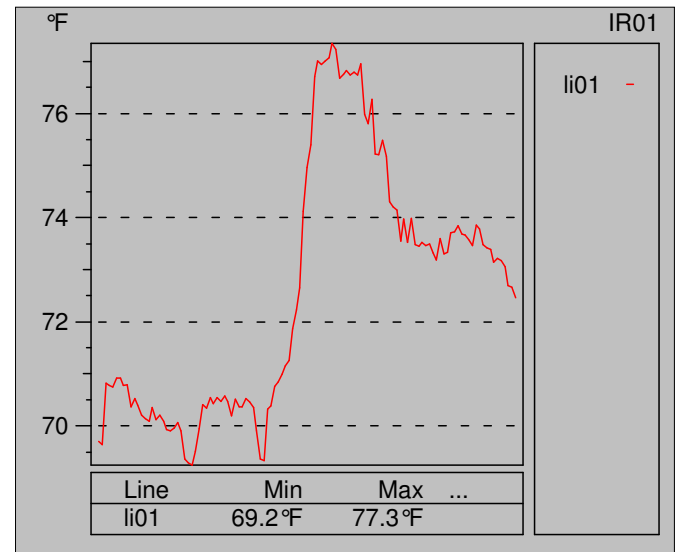
Hot spot is the panel heater.



Component	Equipment/Bucket ID	Plant/Area	Date
Right Panel	SUB 249D	Chemours	11-19-19



Label	Value
IR : max	*271.2°F
IR : min	7.7°F
SP01	*264.4°F
SP02	67.5°F
SP03	72.2°F
LI01 : max	77.3°F
LI01 : min	69.2°F



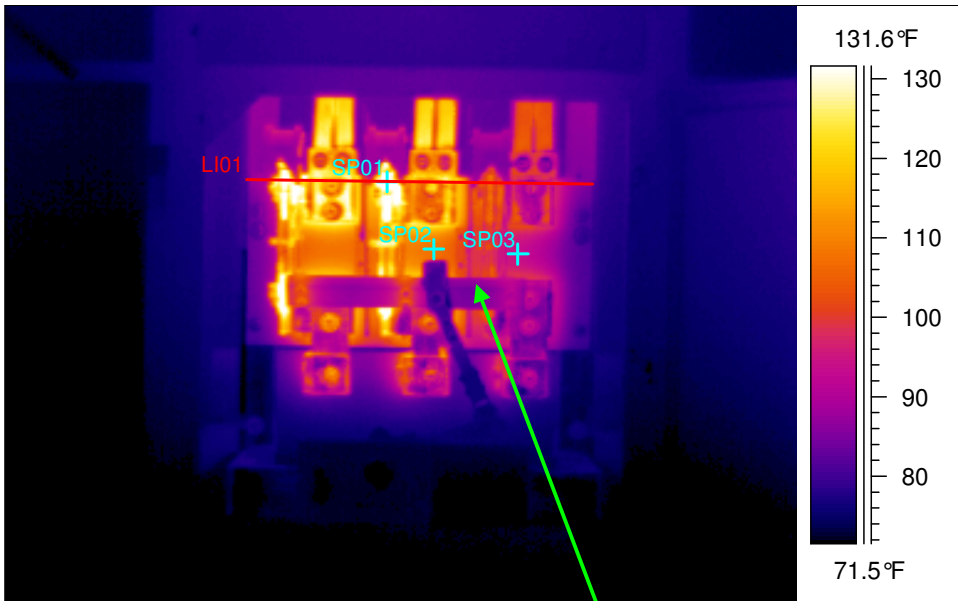
Fault	None
Defect Rating	

Recommendation

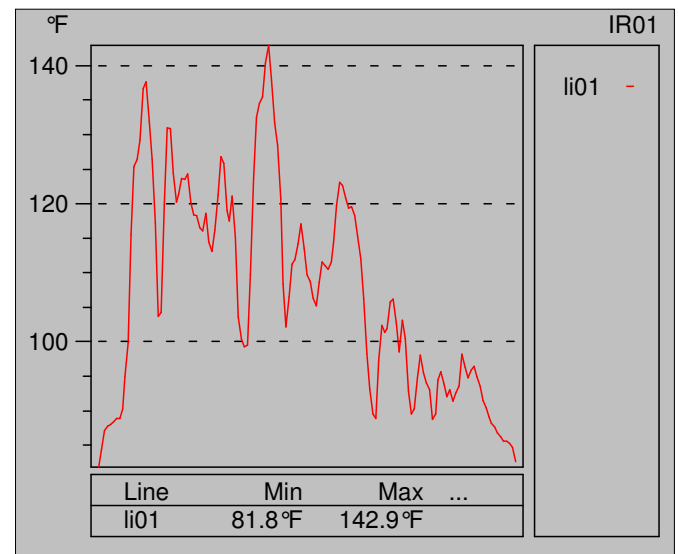
Hot spot is the panel heater.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch Contacts	Load Break Switch 2	Chemours	11-19-19



Label	Value
IR : max	145.1°F
IR : min	67.9°F
SP01	142.9°F
SP02	108.0°F
SP03	93.9°F
LI01 : max	142.9°F
LI01 : min	81.8°F



Fault	Temperature delta at switch contacts.
Defect Rating	Class I

Recommendation

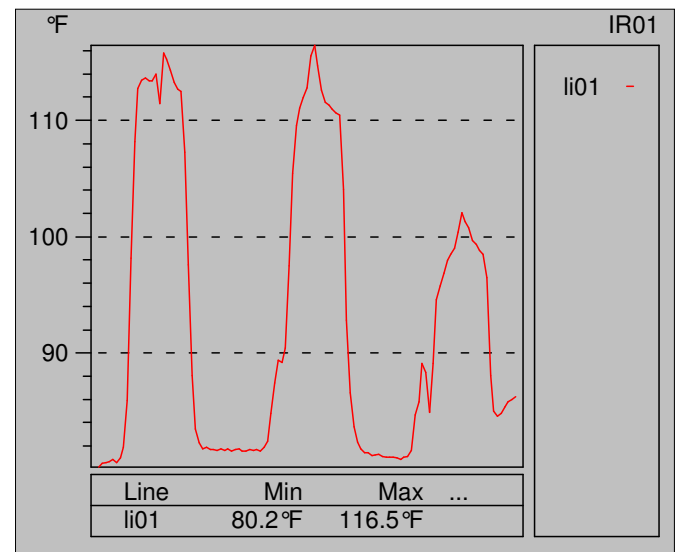
Inspect and Clean, repair or replace switch.



Component	Equipment/Bucket ID	Plant/Area	Date
A/B phase from bottom	Load Break Switch 2	Chemours	11-19-19



Label	Value
IR : max	118.4°F
IR : min	69.4°F
SP01	117.4°F
SP02	116.3°F
SP03	99.6°F
LI01 : max	116.5°F
LI01 : min	80.2°F



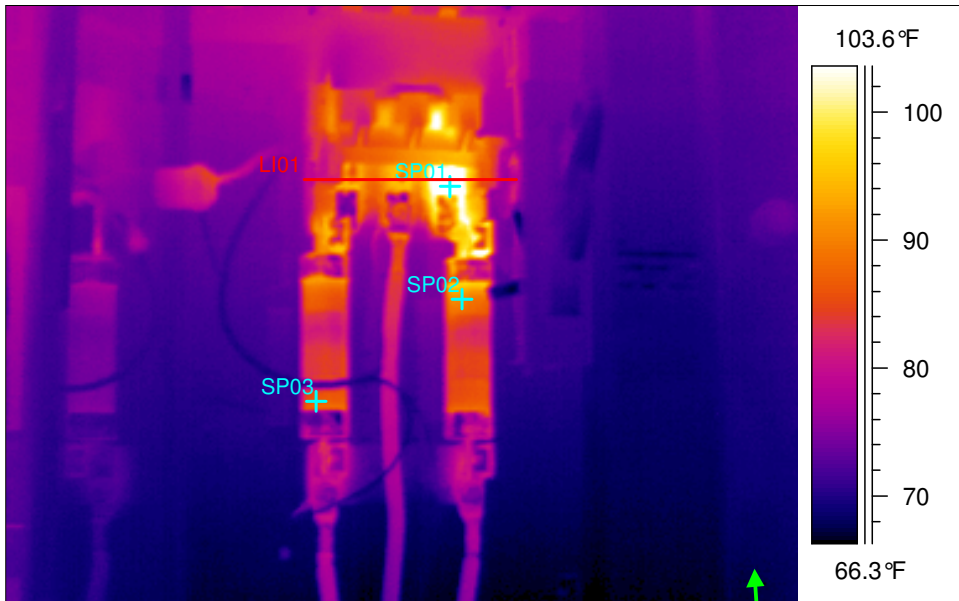
Fault	Bottom switch issue
Defect Rating	See previous sheet on Bottom Switch

Recommendation

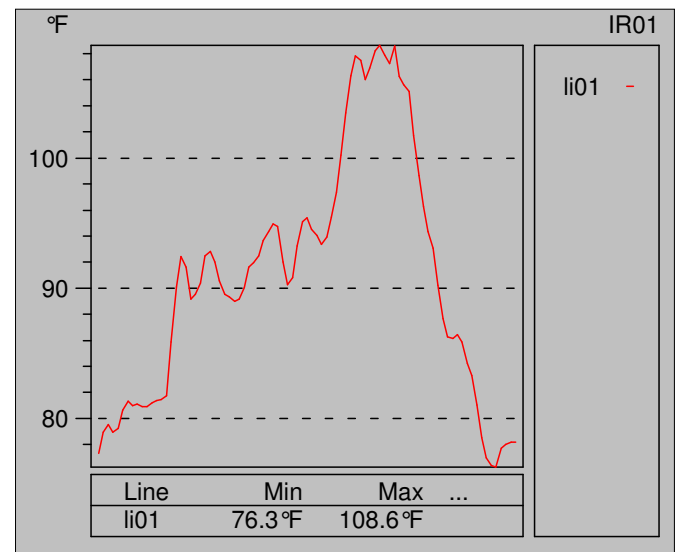
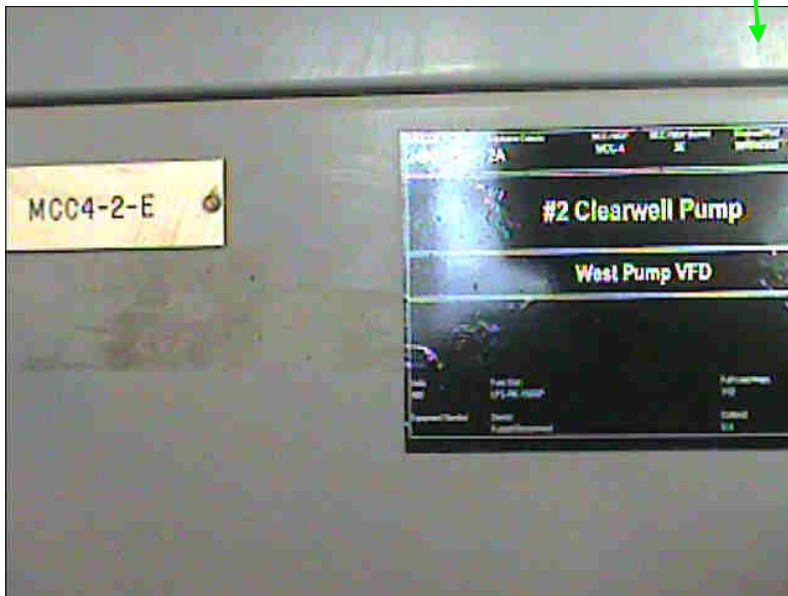
This view is from the top switch showing localized thermal issue coming from the bottom switch on A and B phases.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch/fuse clip	2 E Clearwell Pump	MCC 4	11-20-19



Label	Value
IR : max	114.0°F
IR : min	65.9°F
SP01	113.4°F
SP02	90.6°F
SP03	86.8°F
LI01 : max	108.6°F
LI01 : min	76.3°F



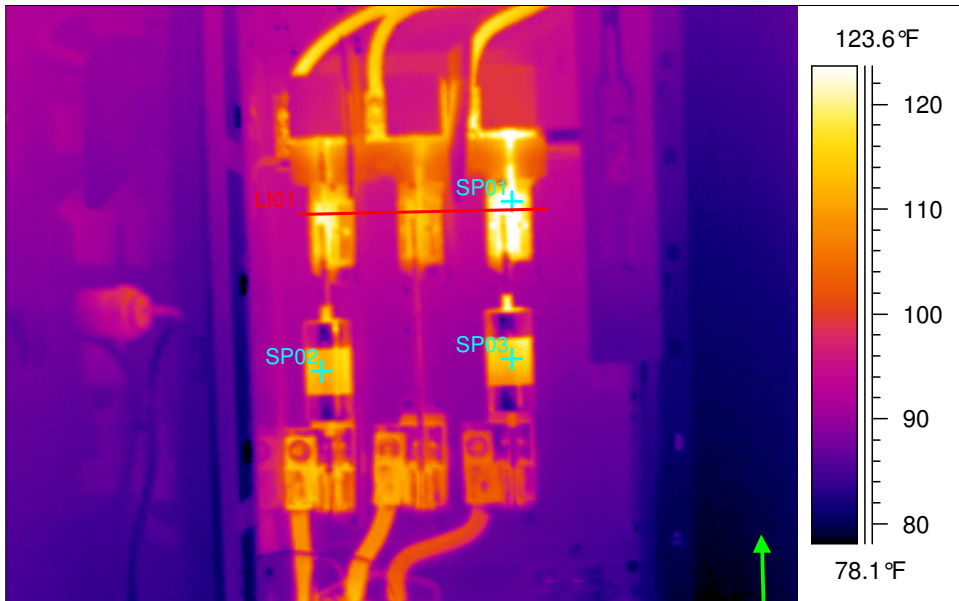
Fault	Poor connection at switch
Defect Rating	Class I

Recommendation

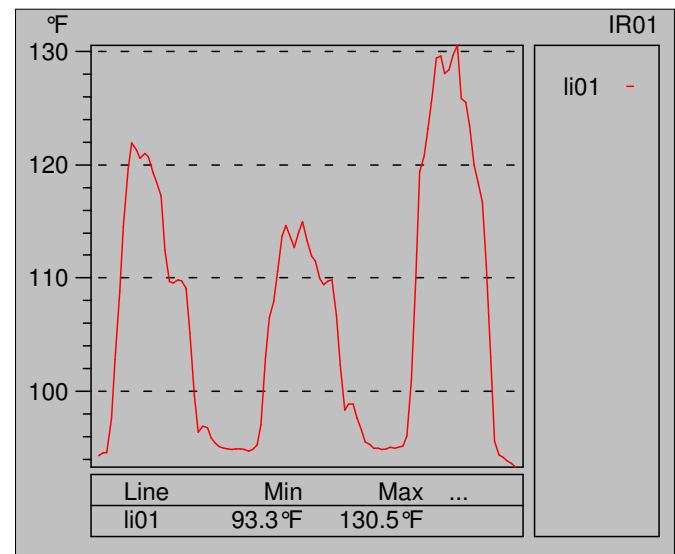
The AC phase switch contact and/or fuse clip shows what looks to be a localized hot spot.
Clean and inspect, repair or replace.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch	5D #6 BFWP	MCC 2	11-20-19



Label	Value
IR : max	131.8°F
IR : min	75.5°F
SP01	129.2°F
SP02	111.7°F
SP03	114.9°F
LI01 : max	130.5°F
LI01 : min	93.3°F



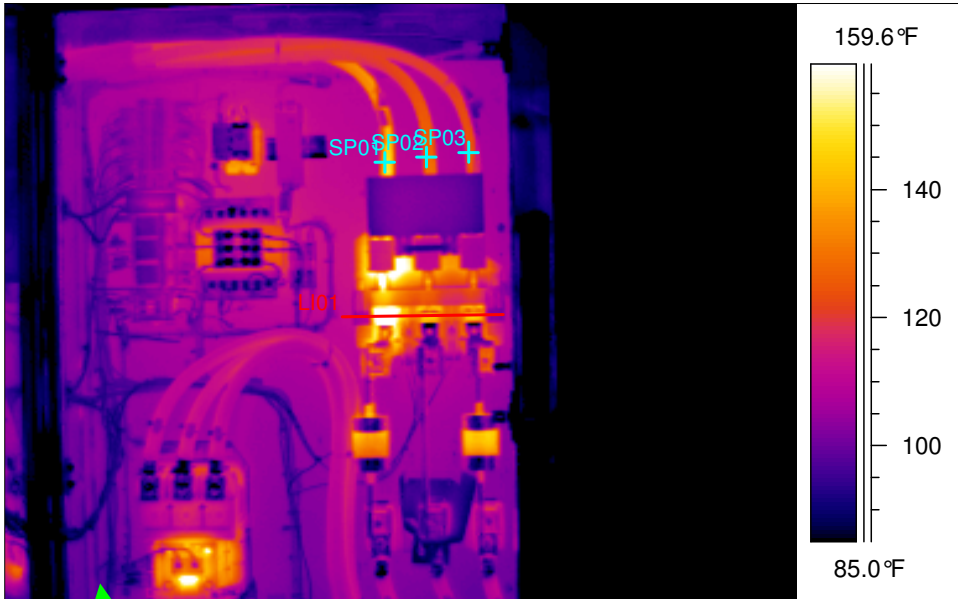
Fault	Poor connection at switch
Defect Rating	Class I

Recommendation

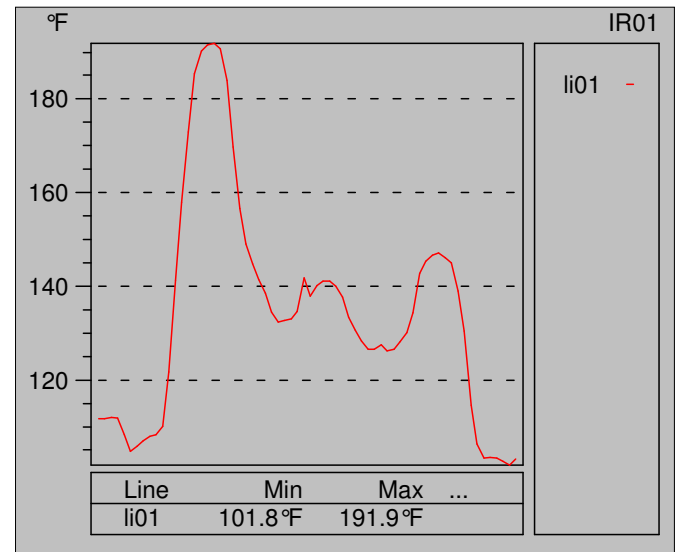
Slight temperature delta at C phase switch contact suggests a poor connection.
Clean and inspect, repair or replace.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch	Well Pump 3	Chemours	11-20-19



Label	Value
IR : max	191.9°F
IR : min	-14.3°F
SP01	144.5°F
SP02	128.8°F
SP03	125.4°F
LI01 : max	191.9°F
LI01 : min	101.8°F



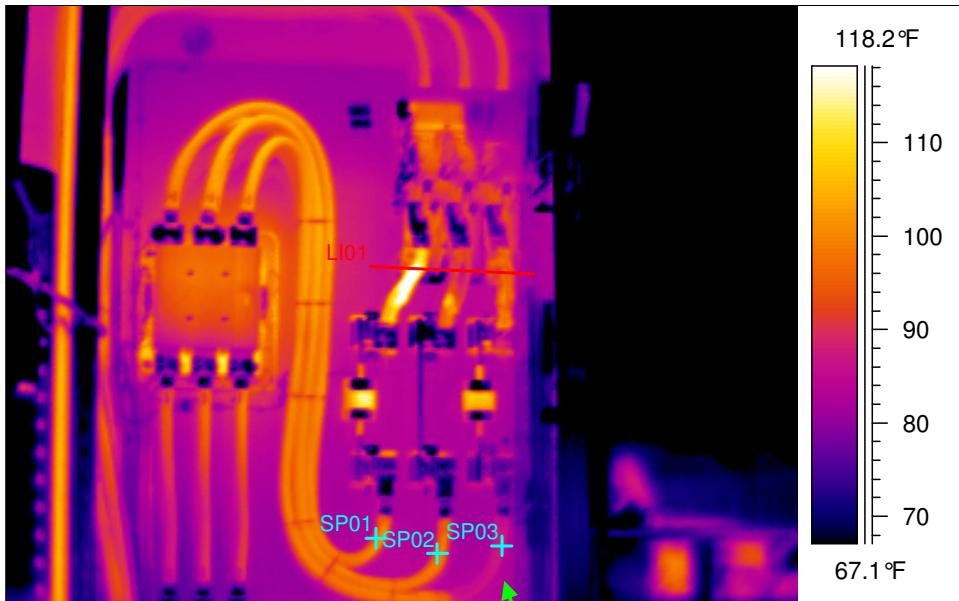
Fault	Poor connction at switch
Defect Rating	Class II

Recommendation

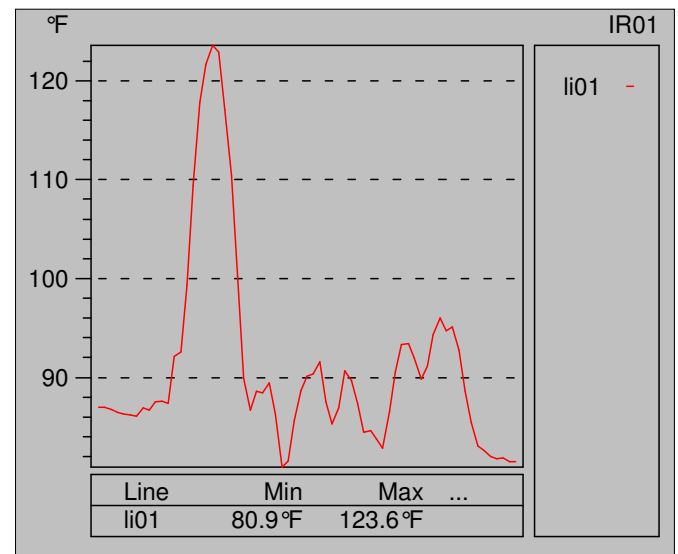
The A phase shows a significant temperature delta. We believe the switch contacts are in poor condition. Clean and inspect, repair or replace.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch conductors	Well Pump 10	Chemours	11-20-19



Label	Value
IR : max	123.6°F
IR : min	-11.3°F
SP01	96.9°F
SP02	97.3°F
SP03	87.8°F
LI01 : max	123.6°F
LI01 : min	80.9°F



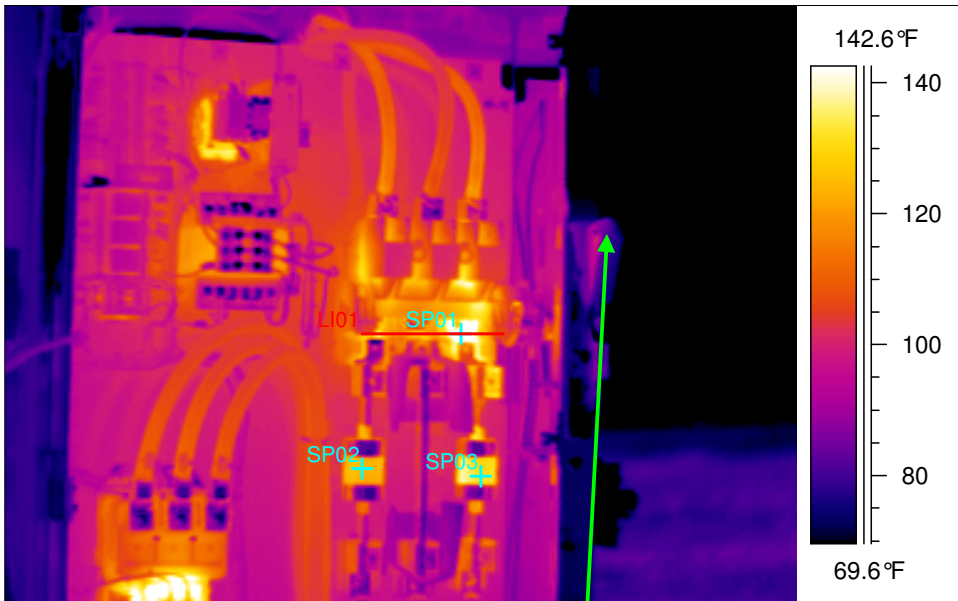
Fault	SwitchConductor Connections
Defect Rating	Class I

Recommendation

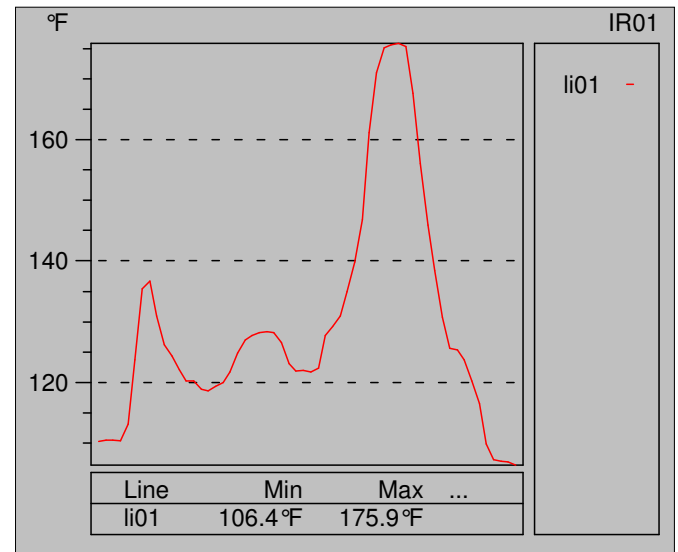
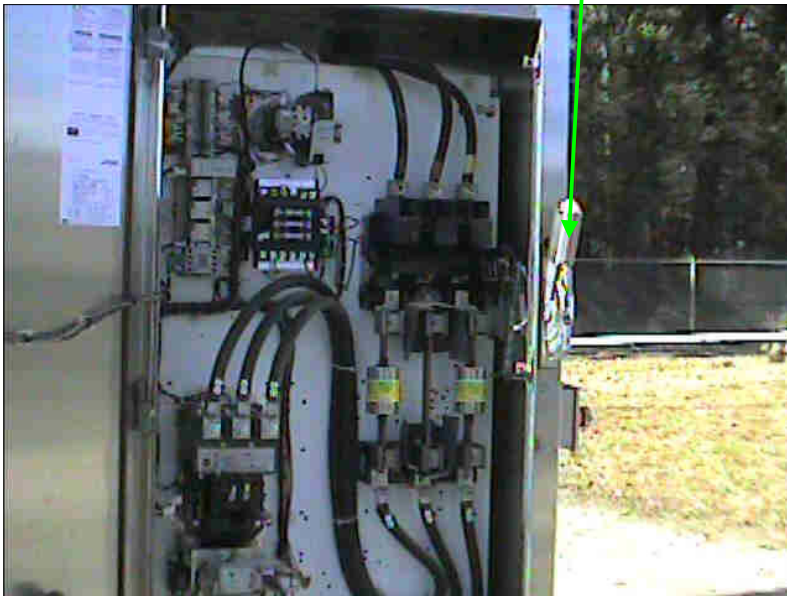
Temperature delta at or near the switch A phase. Check all connections, Clean and inspect, repair or replace.



Component	Equipment/Bucket ID	Plant/Area	Date
Switch	Well Pump 9	Chemours	11-20-19



Label	Value
IR : max	175.9°F
IR : min	19.1°F
SP01	175.7°F
SP02	124.9°F
SP03	130.9°F
LI01 : max	175.9°F
LI01 : min	106.4°F



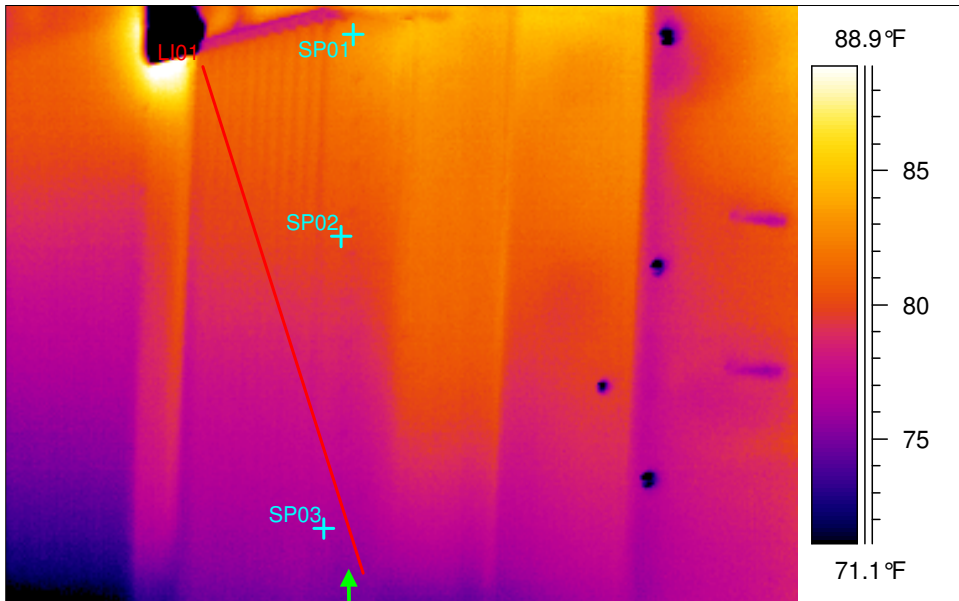
Fault	Poor switch connection
Defect Rating	Class II

Recommendation

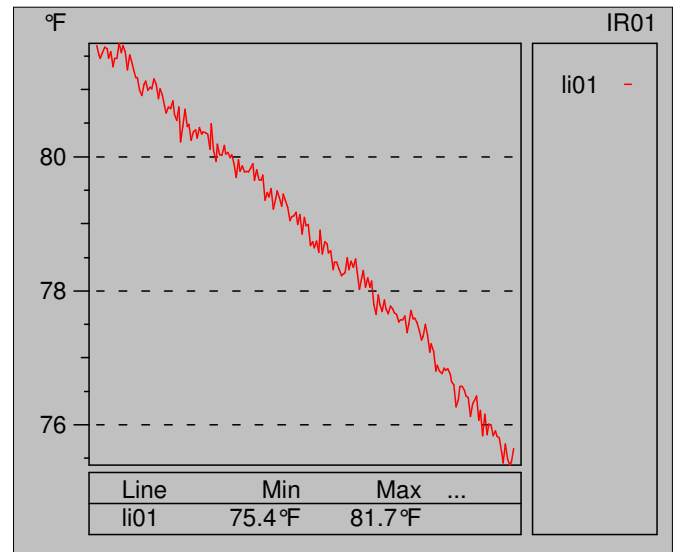
Unit shows temperature delta at switch C phase. We suspect a weak contact.
Clean and inspect, repair or replace.



Component	Equipment/Bucket ID	Plant/Area	Date
Radiator	SUB 270	Chemours	11-20-19



Label	Value
IR : max	90.9°F
IR : min	13.1°F
SP01	82.8°F
SP02	80.2°F
SP03	76.5°F
LI01 : max	81.7°F
LI01 : min	75.4°F



Fault	None
Defect Rating	
Recommendation	