Infared Inspections * Switchgear Testing & Cleaning Vibration Analysis * Arc Flash Hazard Analysis & Training

SAMPLE REPORT
Company Address
City, ST 12345

Inspected on: 9/29/2016

Infrared Electrical Inspection Report

Prepared by Wesley Kasey
True Technical Services, LLC
502.939.3751
wkasey@truetechnicalservices.com

Thank You! True Technical Services, LLC has recently performed service at your facility. The following pages of this report contain important information about the possible safety of your personnel and the reliability of your equipment. True Tech has used one or more predictive maintenance tools to assist you in attaining the health status of your equipment. We encourage you to consult with your engineering staff before making a final determination on repairs. True Technical Services, LLC assumes no liability directly or indirectly as a result of this service.

The ***inventory*** contains a list of all equipment designated by your facility for inspection. Equipment that was tested will be labeled "TESTED" or "T" on the inventory sheet. If a problem was noted with this equipment, it will list a page number that corresponds with a defect page contained in this report. Some items on the list may have not been tested due to: accessibility to equipment, equipment offline, or other barrier. Testing lightly loaded equipment may produce inconclusive results. The overall responsibility of knowing the equipment loading and status falls upon facility personnel.

The ***defect*** pages are listed directly after the inventory pages. Any anomaly(s) noted during the course of your service will be recorded on the defect pages. Each defect page will contain the data gathered, recommendations, and the criticality rating (see table).

Criticality Table	
****	100°F and > ΔT (Temperature Difference) Failure Imminent, Repair Immediately or ASAP
***	65°F - 99°F ΔT (Temperature Difference) Failure Likely, Repair ASAP
**	45°F - 64°F ΔT (Temperature Difference) Failure Possible, Schedule Repair
*	20°F - 44°F ΔT (Temperature Difference) Immediate Failure Unlikely, Repair as Time Permits

The ***criticality rating*** of your equipment was assigned by your technician based on a number of factors which may include some or all of the following: industry standard temperature scale, loading, significance of asset, safety, technicians experience, and other predictive maintenance technologies.

We appreciate the opportunity to serve you. If you have any questions regarding this report, we are happy to assist in any way.

Wesley Kasey - President
True Technical Services, LLC
502.939.3751
wkasey@truetechnicalservices.com

TRUETECH
Technicians Notes

Thank you for having me out to your facility. The scan went smoothly and took about 4 shifts to complete. Your staff was readily available and we had no problem accessing all your panels and spaces.

We discovered 3 loose connections that we could fix on site: AHU 2 – Contactor, Disconnect EF-2 – Wire Lug, Panel P1A – Breaker #14 wire Lug. These connections were found to be loose and we tightened to general installation specifications. The connections did not show signs of excessive heating or any other damage were verified as “repaired” with the infrared imager. There is no further action recommended on the above panels.

We discovered 4 missing breaker blanks in the panels. We provided the list to your staff and they replaced the blanks the same day. There is no further action recommended for these panels.

We documented 8 thermal problems (anomalies). These are all contained in the *Inspection Report.* Temperature Difference (Delta-T, ΔT) between the problem area (hot spot) and the reference point (similarly loaded phase or component) was the primary factor used when assigning the problem a criticality rating. However, if visible damage was noted in a component (see problem #7) This criticality rating was raised without regard to the temperature difference. Often, an electrical component can get hot enough to weld itself. This will temporarily create a low resistant/low temperature circuit. These circuits will fail and are assigned a high criticality rating. Please also note that I looked at any potential problems from many angles. The “Target Temperature” listed in your report was the highest temperature I recorded. The picture was taken at the best angle for repair staff to see the problem and may not show the actual hottest portion of the component.

It was a pleasure working with you and your staff. I am always available should you have any questions regarding the scan. I look forward to serving you in the future.

Thank You,

Wes

Lead Technician: Wesley Kasey
Contact Number: 502.939.3751
Equipment: FLIR P20

Location / Name: Your Facility, Building A1

Location	Equipment	Equipment Name	Status	Anomaly
Outside - Main Substation	Pad Mount	Sub 1	Tested	No
Outside - Main Substation	Pad Mount	Sub 2	Tested	No
Outside - Main Substation	Pad Mount	Sub 3	Tested	No
Outside - Main Substation	Pad Mount	Sub 1A	No Load	No
Outside - Main Substation	Disconnect	Tower A Fan	Tested	No
Outside - Main Substation	Disconnect	Tower B Fan	No Load	No
Outside - Main Substation	Disconnect	Tower A Pan Heater	Tested	No
Outside - Main Substation	Disconnect	Tower B Pan Heater	Tested	No
Outside - East Wall	Branch Panel	EQ1A	Tested	No
Outside - East Wall	Branch Panel	EQ2A	Tested	No
Outside - East Wall	Disconnect	AC-ER	Tested	No
Outside - East Wall	Disconnect	AC-Y	Tested	No
Outside - East Wall	Disconnect	AC (Unnamed left)	No Load	No
Outside - East Wall	Disconnect	AC (Unnamed Right)	Tested	No
Ground Floor, Boiler Room	Disconnect	Boiler 1	Tested	No
Ground Floor, Boiler Room	Control Panel	Boiler 1	Tested	No
Ground Floor, Boiler Room	Disconnect	Boiler 2	Tested	No
Ground Floor, Boiler Room	Control Panel	Boiler 2	Tested	No
Ground Floor, Boiler Room	Disconnect	Boiler 3	Tested	No
Ground Floor, Boiler Room	Control Panel	Boiler 3	Tested	No
Ground Floor, Boiler Room	Distribution Panel	P-3 Left	Tested	Yes, #1
Ground Floor, Boiler Room	Distribution Panel	P-3 Right	Tested	No
Ground Floor, AHU Room	VF Drive	AHU-1 Supply	Tested	No
Ground Floor, AHU Room	VF Drive	AHU-1 Return	Tested	No
Ground Floor, AHU Room	VF Drive	AHU-2 Supply	No Load	No
Ground Floor, AHU Room	VF Drive	AHU-2 Return	No Load	No
Ground Floor, AHU Room	VF Drive	AHU-3 Supply	Tested	No
Ground Floor, AHU Room	VF Drive	AHU-3 Return	Tested	No
Ground Floor, AHU Room	Disconnect	Compressor 2	Tested	No
Ground Floor, AHU Room	Disconnect	EF-1	Tested	No
Ground Floor, AHU Room	Disconnect	EF-2	No Load	No
Ground Floor, AHU Room	Disconnect	EF-3	Tested	No
Ground Floor, AHU Room	Disconnect	Unnamed - E. Wall	Tested	No
Ground Floor, Elevator Room	Disconnect	Elevator 1	Tested	No
Ground Floor, Elevator Room	Disconnect	Elevator 2	Tested	No
Ground Floor, Elevator Room	Branch Panel	EQ1A	Tested	No
Ground Floor, Elevator Room	Branch Panel	EQ2A	Tested	No
Ground Floor, Elect. Rm G20.	Switchboard	MSB-1	Tested	No
Ground Floor, Elect. Rm G20.	Switchboard	MSB-2	Tested	No
Ground Floor, Elect. Rm G20.	Distribution Panel	DP-AA	Tested	No
Ground Floor, Elect. Rm G20.	Motor Control Center	MCC-A	Tested	No
Ground Floor, Elect. Rm G20.	Motor Control Center	MCC-B	Tested	No

Location	Equipment	Equipment Name	Status	Anomaly
Ground Floor, Elect. Rm G20.	Branch Panel	P-4	Tested	Yes, #2
Ground Floor, Elect. Rm G20.	Branch Panel	BP-AB	Tested	No
Ground Floor, Elect. Rm G20.	Distribution Panel	DP-AB	Tested	No
Ground Floor, Elect. Rm G20.	Branch Panel	BP-A1	Tested	No
Ground Floor, Elect. Rm G20.	Branch Panel	BP-A2	Tested	No
Ground Floor, Elect. Rm G20.	Motor Control Center	MCC-C	Tested	No
Ground Floor, Elect. Rm G20.	Auto Transfer Switch	ATS -CR	Tested	No
Ground Floor, Elect. Rm G20.	Auto Transfer Switch	ATS-LS	Tested	No
Ground Floor, Elect. Rm G20.	Auto Transfer Switch	ATS-EM	Tested	No
Ground Floor, Elect. Rm G20.	Branch Panel	BP-BA(1)	Tested	No
Ground Floor, Elect. Rm G20.	Buss Disconnect Riser	A	Tested	No
Ground Floor, Elect. Rm G20.	Buss Disconnect Riser	B	Tested	No
Ground Floor, Elect. Rm G20.	Branch Panel	BP-BA(2)	Tested	No
1st. Floor, Electrical Rm 120.	Branch Panel	BP-1A	Tested	No
1st. Floor, Electrical Rm 120.	Branch Panel	BP-1B	Tested	No
1st. Floor, Electrical Rm 120.	Branch Panel	BP-2A1	Tested	No
1st. Floor, Electrical Rm 120.	Distribution Panel	DP-MDP	Tested	No
1st. Floor, Electrical Rm 120.	Distribution Panel	DP-MDP2	Tested	No
1st. Floor, Electrical Rm 120.	Buss Disconnect Riser	1-A	Tested	No
1st. Floor, Electrical Rm 120.	Buss Disconnect Riser	1-B	Tested	No
2nd. Floor, Electrical Rm 220.	Branch Panel	BP-2A	Tested	No
2nd. Floor, Electrical Rm 220.	Branch Panel	BP-2B	Tested	No
2nd. Floor, Electrical Rm 220.	Branch Panel	BP-2A1	Tested	No
2nd. Floor, Electrical Rm 220.	Branch Panel	BP-2A2	Tested	No
2nd. Floor, Electrical Rm 220.	Buss Disconnect Riser	2-A	Tested	No
2nd. Floor, Electrical Rm 220.	Buss Disconnect Riser	2-B	Tested	No
3rd. Floor, Electrical Rm 320-A.	Branch Panel	BP-3A	Tested	No
3rd. Floor, Electrical Rm 320-A.	Branch Panel	BP-3B	Tested	No
3rd. Floor, Electrical Rm 320-A.	Branch Panel	BP-3A-1	Tested	No
3rd. Floor, Electrical Rm 320-A.	Branch Panel	BP-3B-1	Tested	No
3rd. Floor, Electrical Rm 320-A.	Branch Panel	BP-3-EQ1	Tested	No
3rd. Floor, Electrical Rm 320-A.	Disconnect	Vacuum Pump	Tested	No
3rd. Floor, Electrical Rm 320-A.	Disconnect	Air Compressor	Tested	Yes, #3
4th. Floor, Electrical Rm.	Branch Panel	4EQ4A	Tested	No
4th. Floor, Electrical Rm.	Branch Panel	4A	Tested	No
4th. Floor, Electrical Rm.	Branch Panel	4B	Tested	No
4th. Floor, Electrical Rm.	Transformer	T-4B	Tested	Yes, #4
4th. Floor, Electrical Rm.	Branch Panel	4C(2 SECTION)	Tested	No
Roof, Building A	Disconnect	AHU-21	Tested	No
Roof, Building A	Control Panel	AHU-22	No Load	No
Roof, Building A	Disconnect	AHU-22	No Load	No
Roof, Building A	Control Panel	AHU-23	Tested	No
Roof, Building A	Disconnect	AHU-23	Tested	Yes, #8

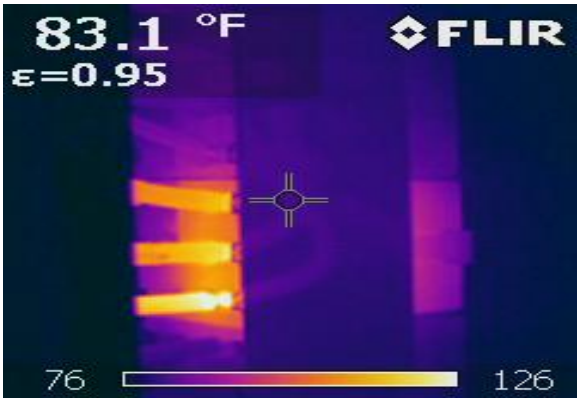
Location	Equipment	Equipment Name	Status	Anomaly
Roof, Building A	Control Panel	AHU-24	Tested	No
Roof, Building A	Disconnect	AHU-24	Tested	No
Roof, Building A	Control Panel	AHU-25	Tested	No
Roof, Building A	Disconnect	AHU-25	Tested	No
Penthouse, Building A	Switchboard	MSB-3	Tested	No
Penthouse, Building A	Control Panel	Chiller-1	Tested	No
Penthouse, Building A	Control Panel	Chiller-2	Tested	No
Penthouse, Building A	Disconnect	Compressor	Tested	No
Penthouse, Building A	Motor Control Center	MCC-EQ	Tested	No
Penthouse, Building A	Branch Panel	P-1A	Tested	No
Penthouse, Building A	Branch Panel	P-1B	Tested	No
Main Electrical Room-B	Switchboard	Main	Tested	No
Main Electrical Room-B	Transformer	Gerber Shop	Tested	No
Main Electrical Room-B	Disconnect	E	Tested	No
Main Electrical Room-B	Disconnect	D	Tested	No
Gerber Shop-B	Branch Panel	D	Tested	No
1st. Floor West, RM B101.	Disconnect	AC North	Tested	No
1st. Floor West, RM B101.	Disconnect	AC South	Tested	No
1st. Floor West, RM B101.	Branch Panel	P3 (2 Sections)	Tested	#1
1st. Floor West, RM B101.	Branch Panel	A	Tested	No
1st. Floor West, RM B101.	Branch Panel	P2	Tested	No
1st. Floor West, RM B101.	Branch Panel	P1 (2 Sections)	Tested	No
1st. Floor West, RM B101.	Transformer	UN (P3)	Tested	No
1st. Floor West, RM B101.	Transformer	UN (P1)	Tested	No
1st. Floor West, RM B101.	Transformer	UN (P2)	Tested	No
Cafeteria, Storage Room	Branch Panel	E	Tested	No
Cafeteria, Storage Room	Distribution Panel	"Gerber Main"	Tested	No
Cafeteria, Storage Room	Transformer	T-SM1	Tested	No
Kitchen	Branch Panel	T-SM2	Tested	No
Kitchen	Branch Panel	B	Tested	No
Kitchen	Branch Panel	C	Tested	No
2nd. Floor B Mech AHU 3&4.	Disconnect	ALL	Tested	No
2nd. Floor B Mech AHU 3&4.	Branch Panel	P4	Tested	#2
2nd. Floor B Mech AHU 3&4.	Branch Panel	SP	Tested	No
2nd. Floor B Mech AHU 3&4.	MCC	MCC-B1A	Tested	No
2nd. Floor B Mech AHU 3&4.	Branch Panel	SP-1	Tested	No
2nd. Floor B Electrical Room	Disconnect	T-9	Tested	No
2nd. Floor B Electrical Room	Disconnect	Quilt Cutting Table	Tested	#3
2nd. Floor B Electrical Room	Branch Panel	A1	Tested	No
2nd. Floor B Electrical Room	Branch Panel	A2	Tested	No
2nd. Floor B Electrical Room	Transformer	9	Tested	#4
2nd. Floor B Electrical Room	Transformer	19	Tested	No
2nd. Floor B Electrical Room	Disconnect	AC-1	Tested	No

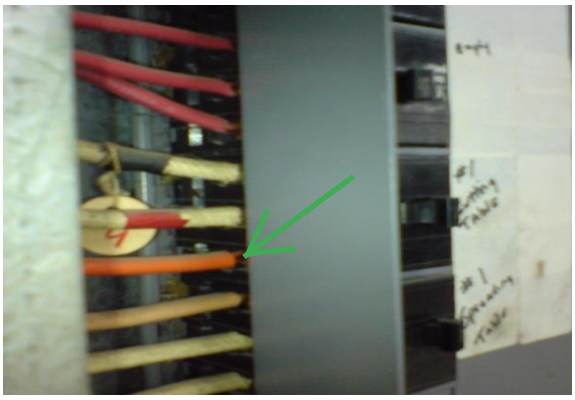
Location	Equipment	Equipment Name	Status	Anomaly
2nd. Floor B Electrical Room	Disconnect	AC-2	Tested	No
2nd. Floor B Electrical Room	Branch Panel	D	Tested	No
2nd. Floor B Electrical Room	Branch Panel	D-1	Tested	No
2nd. Floor B Electrical Room	Transformer	11	Tested	No
2nd. Floor B Electrical Room	Disconnect	Compressor	Tested	Yes #6
Main Compressor Room	Breaker	Dryer	Tested	No
Main Compressor Room	Control Panel	Compressor	Tested	Yes, #5
Supply Room, East Wall	Branch Panel	M	Tested	No
Supply Room, East Wall	Branch Panel	J	Tested	No
Supply Room, East Wall	Branch Panel	B	Tested	No
Supply Room, East Wall	Branch Panel	B-1	Tested	No
Supply Room, East Wall	Circuit Breaker	To T-B	Tested	Yes #7
Supply Room, East Wall	Transformer	T-B	Tested	No

Report Date 9/30/2016 **Company** Facility

Location Ground Floor, Boiler Room

Equipment Panel P-3 (left), Breaker #5 **Anomaly #** 1





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
138° F	118° F	20° F	*

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
28	24	24	50/240

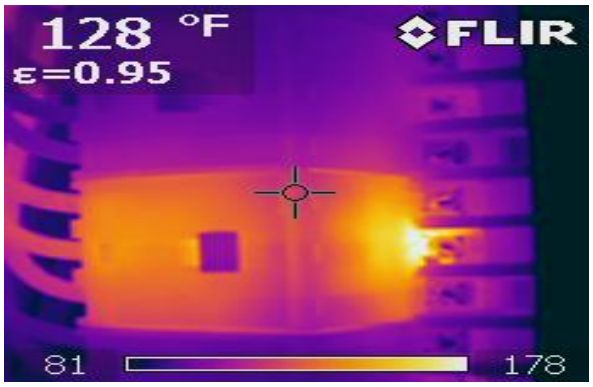
Comments: Target is the Phase C, load side of the pictured breaker. Hot spot is at a minor rise but will continue to worsen with time and loading. Perform maintenance on this breaker as your schedule allows.

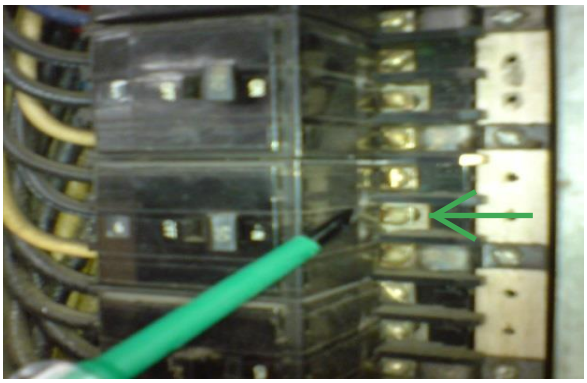
Recommendations: Ensure equipment is in a safe electrical work condition before performing repairs! Remove target wire from lug. Inspect wire and lug for damage, replace as needed. If no damage apparent, clean both wire and lug, reinsert, and tighten to specifications. Validate repairs with an infrared camera or spot radiometer.

Report Date 9/30/2016 **Company** Facility

Location Ground Floor, Elect. Rm G20.

Equipment Panel P-4, Brk #5 **Anomaly #** 2





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
200° F	110° F	90° F	****

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
N/A	N/A	N/A	50/240

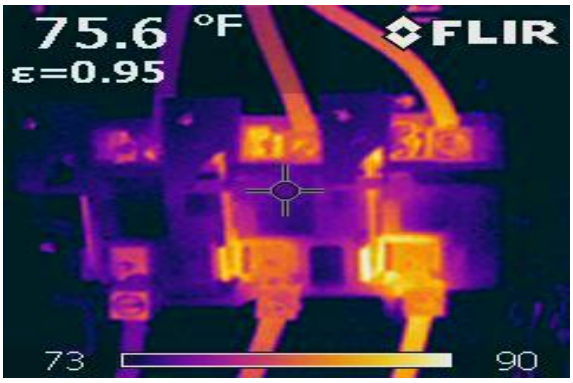
Comments: Target is the Phase B, Buss side of the pictured breaker. Hot spot is at 200F*. Metal can begin to and will continue to worsen with time and loading. Perform maintenance on this breaker asap.

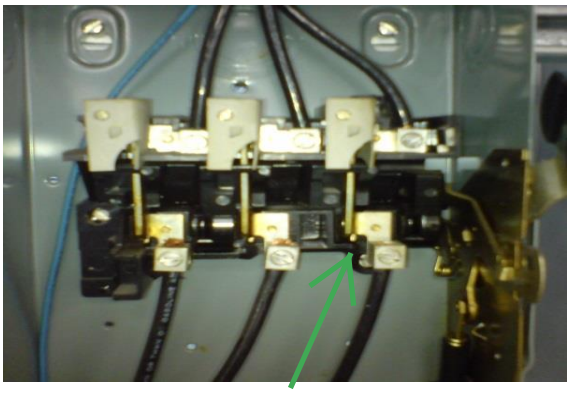
Recommendations: Ensure equipment is in a safe electrical work condition before performing repairs! Remove Breaker from Buss. Inspect breaker and buss for damage, replace as needed. If no damage apparent, clean both breaker and buss, reinsert, and tighten to specifications. Validate repairs with an infrared camera or spot radiometer.

Report Date 9/30/2016 **Company** Facility

Location 3rd. Floor, Electrical Rm 320-A.

Equipment Disconnect, Air Compressor **Anomaly #** 3





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
95° F	85° F	10° F	*

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
30	30	30	100/240

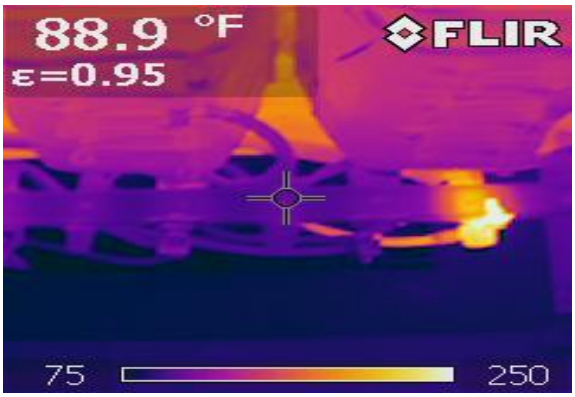
Comments: Target is the Phase C knife switch of the pictured disconnect. Hot spot is at a minor rise but will continue to worsen with time and loading. Perform maintenance on this disconnect as your schedule allows.

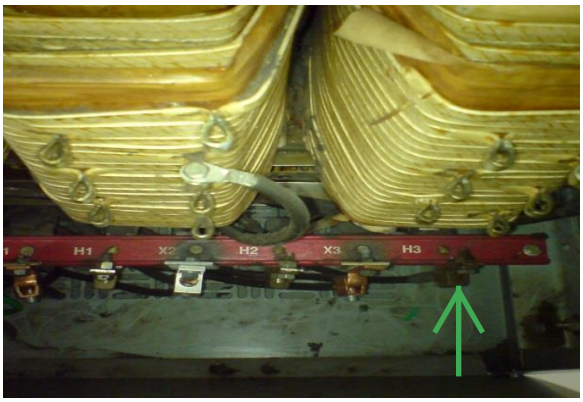
Recommendations: We will inspect next scan to see if there is a significant rise in temperature.If time and resources allow meantime, overhaul this equipment cleaning and tightening each component.

Report Date 9/30/2016 **Company** Facility

Location 4th Floor, Electrical Room

Equipment Transformer T-4B **Anomaly #** 4





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
295° F	115° F	180° F	****

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
N/A	N/A	N/A	200/480

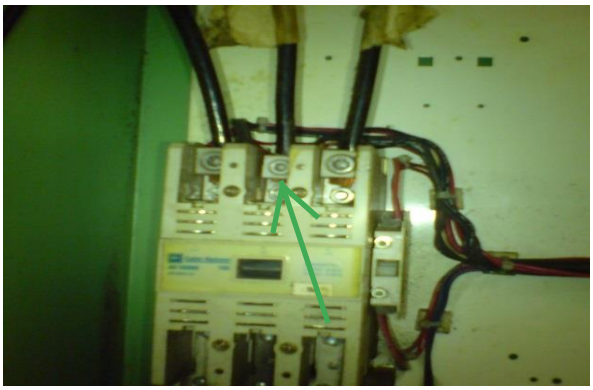
Comments: Target is the H3 Lug on the Transformer. Depending on the amount of time this lug has been over 200F, the lug and or wire may have unrairable damage. Recommend fixing asap.

Recommendations: Ensure equipment is in a safe electrical work condition before performing repairs! Remove lug and inspect for damage. Cleaning and tighten to specifications. Verify repairs with an infrared camera or spot rediometer. Monitor this equipment through various loads monthly until sure repairs were successful.

Report Date 9/30/2016 **Company** Facility

Location Main Compressor Room

Equipment Compressor, Control Panel **Anomaly #** 5



Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
170° F	120° F	50° F	***

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
64	64	64	100/480

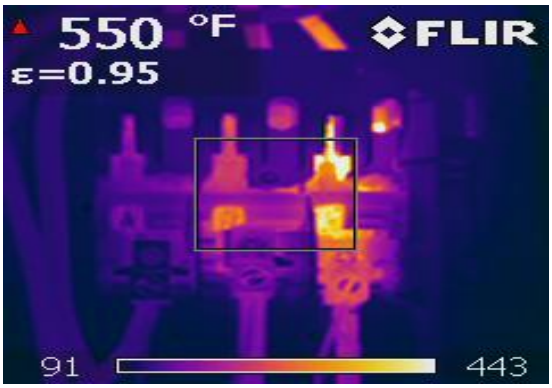
Comments: Target is the Phase B, line side of the pictured contactor "1M". Hot spot is at a significant rise and will continue to worsen with time and loading. Perform maintenance on this contactor asap.

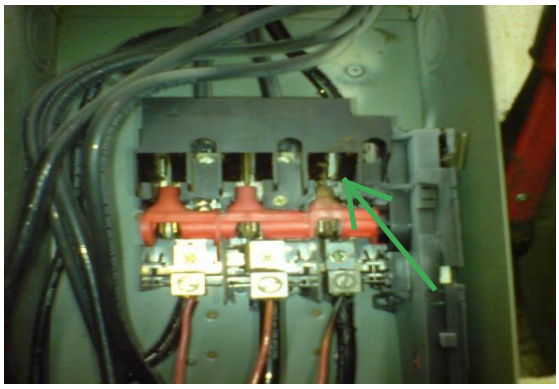
Recommendations: Ensure equipment is in a safe electrical work condition before performing repairs! Remove target wire from lug. Inspect wire and lug for damage, replace as needed. If no damage apparent, clean both wire and lug, reinsert, and tighten to specifications. Validate repairs with an infrared camera or spot radiometer.

Report Date 9/30/2016 **Company** Facility

Location 2nd Floor Compressor Room

Equipment Compressor Disconnect **Anomaly #** 6





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
550° F	275° F	275° F	****

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
64	64	64	100/480

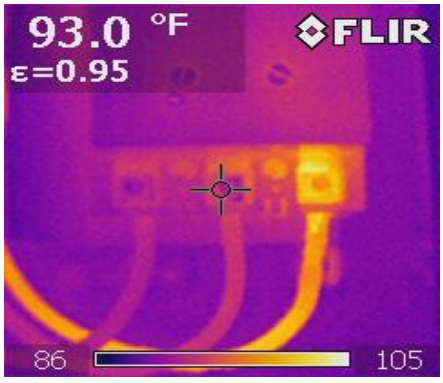
Comments: Replace Disconnect. Failure immintent.

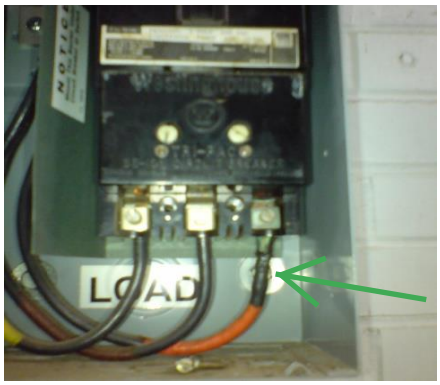
Recommendations: Ensure equipment is in a safe electrical work condition before performing repairs! Extreme heat has likely caused permanent damage to this disconnect. Replace asap.

Report Date 9/30/2016 **Company** Facility

Location Supply Room, East Wall

Equipment Circuit Breaker to Transformer T-B **Anomaly #** #7





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
105° F	95° F	10° F	****

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
10 Amps	10 Amps	12 Amps	70/480

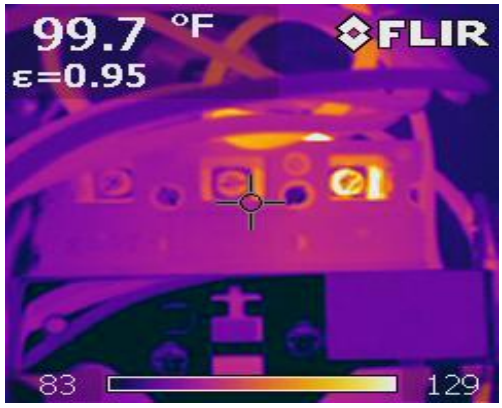
Comments: Disconnect for Boiler 3 located in the Boiler Room shows signs of extreme heat on the phase C load side wire lug area. The temperature difference at time of inspection was only 10 degrees. This is a minor rise. However, the component may have welded itself shut from previous heating. Since the component shows damage as a result of heat, it is recommended that this breaker receive service asap.

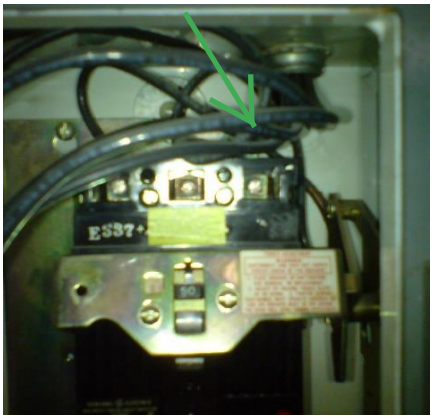
Recommendations: Strip back insulation to undamged section of wire. Clean lug. Ensure component is inserted into lug properly and torqued to specifications.

Report Date 9/30/2016 **Company** Facility

Location Roof - Building A

Equipment Starter-Disconnect - "AHU 23" **Anomaly #** #8





Target Temperature	Reference Temperature	Temperature Difference	Criticality Rating
145° F	100° F	45° F	**

Amperage A	Amperage B	Amperage C	Rated Amps/Volts
N/A	N/A	N/A	50/480

Comments: Starter-Disconnect "AHU-23" located on the roof of Building A, has a hot spot. The Phase C, line side wire lug is loose or damaged.

Recommendations: Inspect the lug for damage. Clean and tighten to specs. Check work with an IR camera or spot radiometer.