Electrical Infrared & Thermal Imaging Inspection

Electrical Infrared & Thermal Imaging Inspection**Nova Centre IR Scan 2023**

Report Title	Nova Centre IR Scan 2023
Company Name	Page Property Management
Phone	902-579-2686
Email	cthomas@pagepm.ca
Site Name	Nova Centre, Halifax
Site Location	1650 Grafton St, Halifax, NS B3J 0E8
Thermographer	Patrick Miller
ITC Certification No.	Level II Thermographer (221112-1)

IR Report Summary

On May 17, 18, 19, 2023, Dynamic Thermal Imaging conducted a thermal inspection of the electrical assets at The Nova Centre in Halifax, Nova Scotia.

The electrical equipment located in the facility appeared to be in relatively good condition, however; our findings show that there are thermal anomalies to be addressed. Items in the Recommendations table below have a severity rating that indicate the urgency and suggested timeline when the item should be addressed. See Recommendations table on page 3, 4 & 5 of this report.

In addition to the thermal anomalies stated in the report, our electrical thermographers are asked to make note of any electrical issues found that are not relatable to the thermal imaging inspection. These findings can be code violations, substandard trade installations, unpermitted electrical modifications, changes to the environment that now affect the electrical equipment, or deterioration of electrical equipment over time. Below you will find our technician's notes taken throughout the inspection process. These notes are not conclusive and are strictly observations for the client to decide whether to be actionable items.

Technician Notes:

- Virtually all of the transformers in the electrical rooms located in the parkades were very dusty. With transformers already running hot, the dust and dirt acts as an insulator which increases the temperature inside the equipment. Recommend shutdown and cleaning at regular intervals (annual biennial).
- Electrical panels located in the Convention Centre electrical room on Argyle have consistent loose connections in almost every 120/208V panel. You will see the IR results on DTI's Infrared # 22565 and greater. As almost every connection was abnormally loose, our technician would need to return to complete a torquing and tightness check on all of the branch circuit wire terminations. It is recommended to have this performed when convenient for HCC, but at the earliest.
- 60A disconnect switches in all of the TKE elevator rooms have a piece of paper indicating that the disconnect may still be energized in the OFF position. This is likely due to internal components in the elevator control panel that provide emergency power in the event of a power failure. It is strongly recommended to have proper lamacoids made to indicate the hazard in a permanent manner.
- Many of the disconnects feeding the pump VFDs are oversized (which is good), resulting in virtually no thermal anomalies on the 30A, 60A, 100A disconnect switches. Even when the VFDs were put in Hand' mode and ramped up to 60Hz, there were still no anomalies. (This is a good thing).
- When carrying out our electrical IR inspections, our technicians most always make a high-level observation of the electric motors. Our technician noticed that with two chillers down for service, motor CWP-1 is running at about 10°C hotter than HDP-1 motor, which has the same ratings, and under the same load. According to the US Department of energy, for every 10°C rise in operating temperature, the motor insulation life is reduced by half. The elevated temperature would indicate that this pump is (and has been) running 24/7, and for a long time. It is recommended to cyclethe load to another pump when possible to prevent overuse and overheating.

Summary Table

DTI Infrared No.	Fault Rating	Label	Equipment Type/ Description	Rating	Location	IR Photo	Page Number
222125	Potential	E6P2A cct	Breaker	208V,30A	Mechanical Room	FLIR1912.JPG	9
222130	Normal	PNL-6P2C cct	Breaker	208V,30A	Mechanical Room	FLIR1913.JPG	10
222034	Repair Required	PNL-ET7P6A cct	Breaker	347V,15A	Generator Room 672	FLIR1917.JPG	14
222562	Repair Immediately	PNL-P2P6A, Breaker Pump	Breaker	600V,70A	P1 Chiller Electrical Room Mezzanine	FLIR1948.JPG	37

Background

Purpose

The purpose of an infrared inspection is to detect heat in energized electrical equipment and other visual electrical deficiencies.

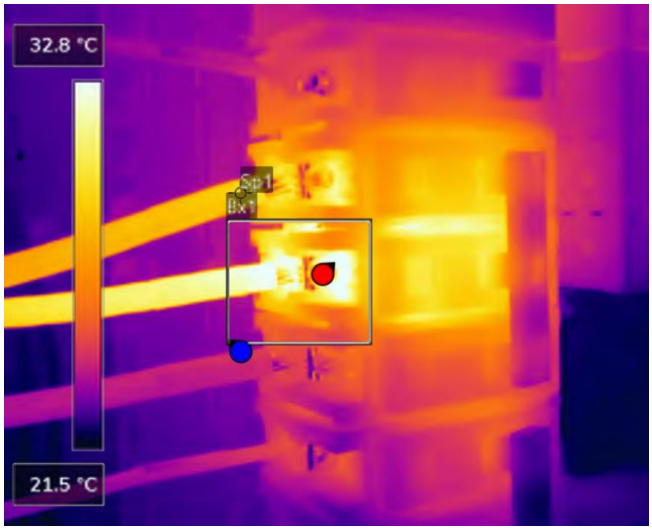
Heating is normal in any electrical system since it is caused by the flow of current through a conductor.

Therefore, the heat we are searching for is abnormal heat. Unusual heating conditions are caused by several phenomena such as:

DTI Infrared No. **222125** Equipment Label: **E6P2A cct 15,17,19**

Fault Rating: **Potential Problem**

Image Title: FLIR1912.jpg **Image Date&Time: 2023-05-17 9:58:04** **Camera Model: FLIR E96**



Equipment Summary		Measurements		Parameters	
DTI Infrared No.	222125	**Sp1**	29.3℃	**Emissivity**	0.95
Location	Mechanical Room 676	**Bx1**		**Distance**	0.24m
Label	E6P2A cct 15,17,19	Max	35.8℃	Atmospheric temp.	20.0℃
Equipment Type/Description	Breaker	Avg	28.1℃	Relative humidity	50.0%
Rating	208V 30A	Min	23.2℃	Ext. optics temp.	20.0℃
Problem	Current exceeds 80% of the breaker rating.	**Dt1(公式)**		Reference temp.	0.0℃
		Bx1.Max-Sp1	6.5℃		
Recommendation	Replace breaker.	Delta			
Action	Repair Required	Value			

Amperage Reading:	31.2200 A

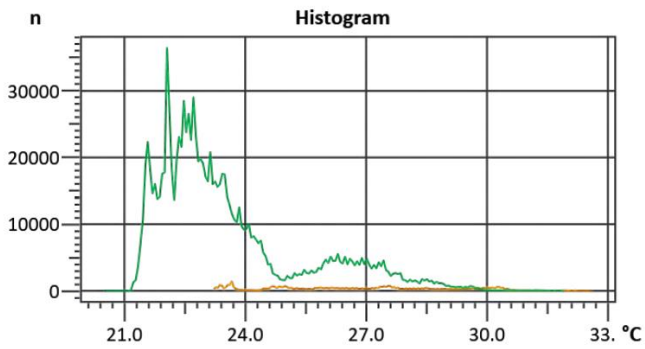
Technician Note:

High temperature connection found on 3p30A breaker CCT 13,15,17, feeding Emergency Panel E6LP2D. Current readings are: PhA 22A, PHB

31A, PhC 7A. This emergency panel shows an unbalanced load which should be investigated further. Unbalanced loads may be caused by too many loaded circuits on one phase, or time of day use. Balancing a panel can be particularly difficult due to different loads being energized at different times.

Current readings exceed the rating of the breaker. Wire appears to be #6awg copper, which can safely be put under a 3p60A breaker. Recommend upsizing this breaker to avoid unwanted

Severity: Potential Problem



downtime of emergency panel.