



High Voltage Electrical Equipment Thermal Imaging /Infrared Survey Report Sample.

**Thermography Inspection at
(ABC Company).**

Address:

By Rick Turdubay, Certified Infrared Investigator.

Date: Month/Day/Year



**AITUR
GROUP LTD.**


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Relationship to Standards

- Section 02 27 23 National Master Specification (NMS) Thermographic Assessment – Electrical Systems.
- Canadian General Standards Board, Document 149-GP-2MP, Manual for Thermographic Analysis of Building Enclosures.

	Thermography Inspection at: (site)	Date:
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How Infrared Thermography Works

Infrared imagers “see” the heat radiated from your equipment in real time, just like a video camera sees visible light. In black/white thermograms (pictures of heat), white is hot and black is cold unless stated otherwise. When thermograms are in color, colors in the scene are matched to the reference bar. Colors appearing closer to the top or right of the reference bar indicate higher temperatures. Colors appearing closer to the bottom or left of the reference bar indicate lower temperatures.

Inspection Site Information

Customer	ABC Power Distribution Corporation
Address	
Contact person	
Phone number	
E-mail address	
Thermographer	Rick Turdubay, Flir Certificate # CON368112

Information:

Limited Liability, Errors & Omission.
 All conclusions and recommendations are based on the data taken at the time of the inspection and no guarantee regarding additional issues of any anomalies found as a result of any other source present or not present at the time of the investigation are made. It is client's responsibility to have the recommended 60% or more of a rated electrical load during the 3-4 hours before inspection.
 No one can predict when a failure will occur. As a result, we suggest that you use the Subjective Repair Priority Ratings as a guide but that you investigate and take appropriate corrective actions as soon as possible.

Repair Priority Ratings
 Each thermogram is given a Subjective Repair Priority Rating which is based upon your qualified assistant’s opinion of how critical the subject item is to the safe and profitable operation of your overall system. The Inspection Summary section of this report explains how to use this Subjective Repair Priority Rating to help you determine how quickly you need to investigate and correct the potential problem.
 Overheating can cause premature deterioration and costly, unplanned failure of your equipment. Overheating connectors, conductors and components will never get better. In fact, the temperature and rate of deterioration will increase with time.

Overview of Fault Rating:

0: Normal	Temp rise 0-5 °C	No action
1: Low grade	Temp rise 5-10 °C	To be monitored – Plan new inspection
2: Medium grade	Temp rise 10-35 °C	Repair at scheduled shut down
3: Severe	Temp rise >35 °C	Repair immediately



Thermography Inspection at:
(site)

Date:

Summary of Inspection.

Location (Where)	Equipment (What)	Fault ()	Recommendation ()	Page Number
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ОАО «Северэлектро»

1. Distribution Substation "Centre" 35/6 kV level	Indoor Switchgear	2/Medium	Repair at scheduled shut down	4
2. Distribution Substation "Centre" 35/6 kV level	Switchgear cubicle	0/ Normal	No action	5
3. Distribution Substation "Centre" # 4 35/6 kV level	Bushing 35kV	2/Medium	Repair at scheduled shut down	6
4. Distribution Substation "Centre" # 4 35/6 kV level	disconnector	2/Medium	Repair at scheduled shut down	7
5. Distribution Substation "North "at 35/6/10 kV	Bushing 10kV	2/Medium	Repair at scheduled shut down	8
6. Distribution Substation "North "at 35/6/10 kV	Feeder disconnector	3: Severe	Repair immediately	9



Thermography Inspection at:
(site)

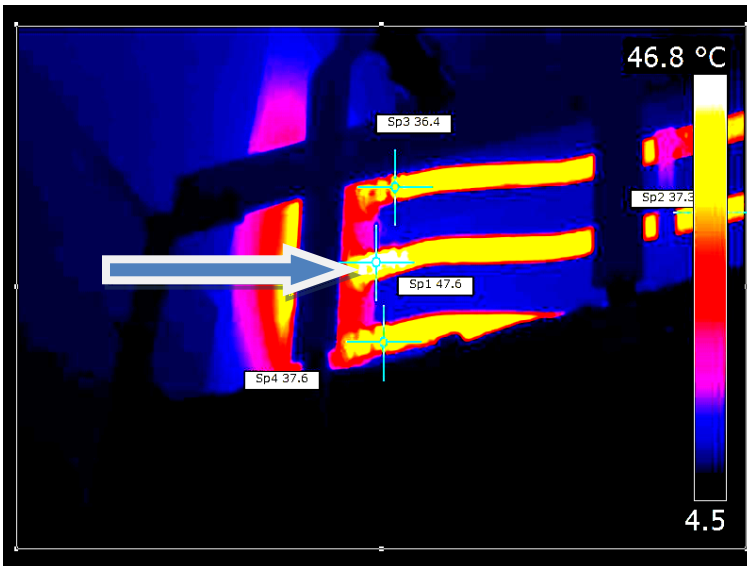
Date:

Photo and Identification:

Digital Picture is Impossible
as the interior light is not efficient

Location	Distribution Substation " Centre" at 35/6 kV level
Equipment	Indoor Switchgear ,35/6 kV level
Type	Bus duct # 6
Nom/Rated Load	1000A
Actual Load	1100A Phase loads not provided
Fault	Fault Rating: 2 Max. Temp °C =46.7, Min=4, 4 Temp. rise between the phase B bus and its bolted joint is 10.4 °C (Sp1=46.7; Sp2=37.3)

Thermogram



Room Temp. =12.6;
Rel. Humidity= 44.6 %.
Emissivity= 0.90; Distance=5m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Phase loads unknown/not provided. As per the customer's information actual load is =110%. It seems the phase B bolted connection is loosed or has corrosion. Temp. rise between the phase B bus and its bolted joint is 10.4°C. This might be considered a level 2, **Repair at scheduled shut down**. Contact your service company to plan a preventive action.

Inspected By: (Rick Turdubay)	Signature:	Date
Repaired By: Comment:		



Thermography Inspection at:
(site)

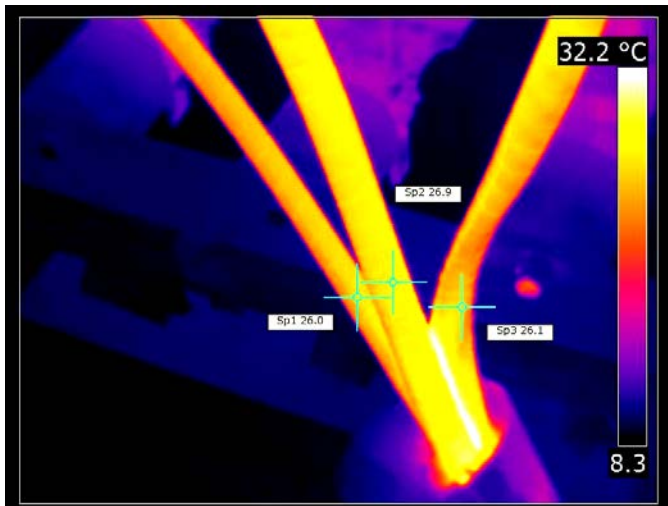
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Location	Distribution Substation " Centre" at 35/6 kV level
Equipment	Switchgear cubicle# 10,Switch B6
Type	Feeder # 10
Nom/Rated Load	630A
Actual Load	300A Phase loads not provided
Fault	Fault Rating: 0, Normal Max. Temp °C =26.9, Min=8, 2 Temp. rise between the phases A and B is 0.9 °C (Sp1=26.0; Sp2=26.9,Sp 3=26.1) See IR picture.

Thermogram



Room Temp. =10.2;
Rel. Humidity= 53.5 %.
Emissivity= 0.90; Distance=2m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Phase loads unknown/not provided. As per the customer's information actual load is =50%. Temp. rise between the phases A and B is 0.9 °C. This might be considered a **level 0, Normal**.

Inspected By: (Rick Turdubay) Signature: Date

Repaired By:
Comment:



Thermography Inspection at:
(site)

Date:

Photo and Identification:

Digital Picture is Impossible
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Location	Distribution Substation " Centre"# 4 at 35/6 kV level
Equipment	Bushing 35kV, Transformer #1
Type	Bushing insulator
Nom/Rated Load	630A
Actual Load	Actual and phase loads not provided.
Fault	Rating: 2 Max. Temp °C =31.9, Min=7.8 Temp. rise between the phase B bus and its bolted joint is 27.6 °C (Sp2=31.6; Sp4=14) (Sp1=24.9; Sp5=14.3) See IR picture.

Thermogram



Room Temp. °C =10.8;
Rel. Humidity= 54 %.
Emissivity= 0.90; Distance=5m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Actual and phase loads unknown/not provided. Temp. rise between the phase B bus and its bolted joint is 27.6 °C. It seems the phase B bolted connection is loosed or has corrosion. This might be considered a level 2. **Repair at scheduled shut down.** Contact your service company to plan a preventive action.

Inspected By: (Rick Turdubay)	Signature:	Date
Repaired By: Comment:		



Thermography Inspection at:
(site)

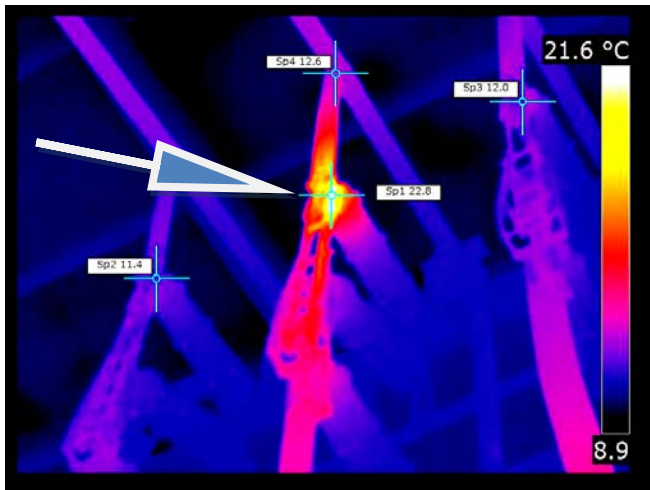
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Photo and Identification:

Digital Picture is Impossible
as the interior light is not efficient

Location	Distribution Substation " Centre" # 4 at 35/6 kV level
Equipment	Transformer #1, 35 kV disconnecter
Type	Blade contacts
Nom/Rated Load	630A
Actual Load	Actual and phase loads not provided.
Fault	Rating: 2 Max. Temp °C =22.8, Min=8.8 Temp. rise between the phase B blade contact and its bolted joint is 11.2 °C (Sp1=22.8; Sp4=12.8) See IR picture.

Thermogram



Room Temp. °C =10.8;
Rel. Humidity= 54 %.
Emissivity= 0.90; Distance=5m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Actual and phase loads unknown/not provided. The temp. rise between the phase B blade contact and its bolted joint is 11.2 °C. It seems the phase B blade contact connection is loosed or has corrosion. This might be considered a **level 2**.
Repair at scheduled shut down. Contact your service company to plan a preventive action.

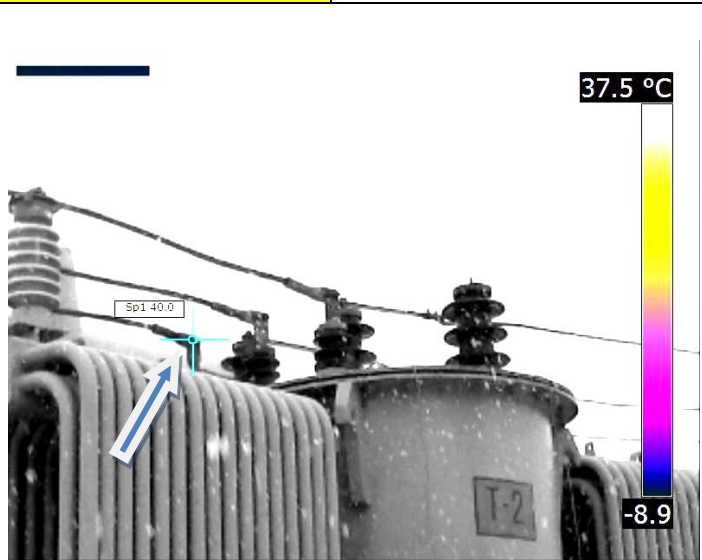
Inspected By:	(Rick Turdubay)	Signature:	Date
Repaired By:			
Comment:			



Thermography Inspection at:
(site)

Date:

Photo and Identification:



Location	Distribution Substation " North "at 35/6/10 kV
Equipment	Bushing 10kV, Transformer #T2/6600 kVA
Type	Phase C
Nom/Rated Load	1000A
Actual Load	650A, Phase loads not provided.
Fault	Rating: 2 The temp. rise between the phase C bushing insulator and its conductor is 23.1 °C (Sp2=21.3; Sp3=15.2) (Sp1=40; Sp4=15.7) See IR picture.

Thermogram



Outside Temp. °C =8;
Rel. Humidity= 50 %.
Emissivity= 0.90; Distance=5m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Phase loads unknown/not provided. Actual load is 65%. The temp. rise between the phase C bushing insulator and its conductor is 23.1 °C . It seems the connection between the phase C bushing insulator and its conductor is loosed or has corrosion. This might be considered a **level 2. Repair at scheduled shut down.** Contact your service company.



Thermography Inspection at:
(site)

Date:

Photo and Identification:



Location	Distribution Substation " North "at 35/6/10 kV
Equipment	Feeder disconnect, 35 kV, Transformer #2
Type	Phase C
Nom/Rated Load	1000A
Actual Load	650A Phase loads not provided
Fault	Rating: 3 The temp. rise between the disconnect phase C and the contact wire line/conductor is 36.7 °C (Sp1=44.9; Sp2=9.2) See IR picture..

Thermogram



Outside Temp. °C =8;
Rel. Humidity= 50 %.
Emissivity= 0.90; Distance=5m
See IR picture.

**RESERVED FOR THERMOGRAM
AFTER COMPONENT REPAIR/**

Analysis and Recommended Action:

Phase loads unknown/not provided. Actual load is 65%. The temp. rise between the disconnect phase C and the contact wire line/conductor is 36.7 °C. It seems the contact wire line/conductor consists 2 pieces of conductors connected by bolted joints. This might be considered a **level 3. Repair immediately** .Contact your service company.

Inspected By: (Rick Turdubay)	Signature:	Date:
Repaired By:		
Comment:		