



WESAM SYSTEMS

**Thermography Inspection for Electrical Equipment
at

**Date:
10/11/2014**



WESAM SYSTEMS

**Thermal Inspection for Electrical Equipment
Using Advanced FLIR T640 Thermal Camera**

For

Customer:*****

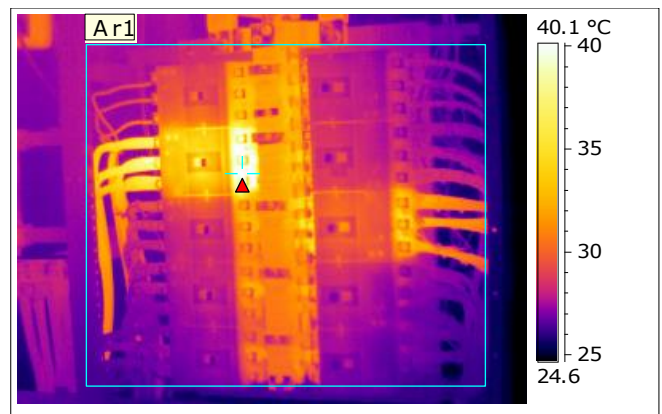
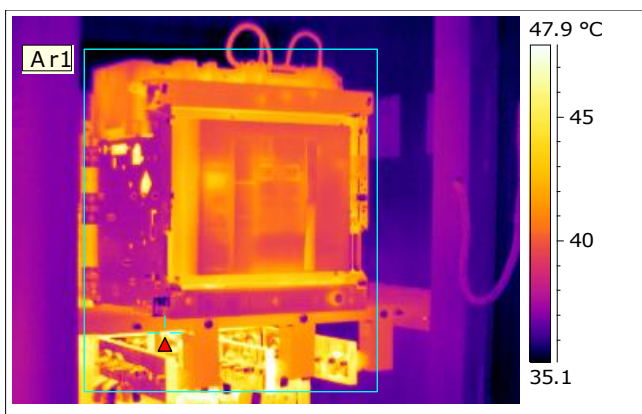
Location:*****

10/11/2014

By

Engr. Adrian Arigo

**Associate Electrical Engineer, SCE
ITC Level 1 Thermographer**





WESAM SYSTEMS

**Thermography Inspection for Electrical Equipment
at**

**Date:
10/11/2014**

Inspection Site Information

Customer	*****
Address	*****
Contact Person	*****
Mobile	*****
Email	*****
WESAM Contact person	Mr. Abdulrahman Al-Tayaran
Phone number	0543865200
E-mail address	abdulrahman@wesams.com
Thermographer	Engr. Adrian Arigo

Tool used for the service:

Using Advanced FLIR T640 Thermal Camera

Engineer's Qualifications:

Engr. Adrian Arigo, Associate Electrical Engineer, SCE & ITC Level 1 Thermographer

Contact Details:

WESAM SYSTEMS Co. Ltd
101 Business Tower
King Abdulaziz road, Jubail
Kingdom of Saudi Arabia
Riyadh Tel: 0112795057
Jubail Tel: 0133616126
Jeddah Tel: 0122203061

Email: info@wasams.com

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: High	Temp rise >35 °C	Repair immediately



WESAM SYSTEMS

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at

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10/11/2014**

Summary of Findings				
Location	Equipment	Fault	Recommendation	Page Number
SCECO Building EB - 028	Switchgear A + B – Panelboard 1	Normal	No Action	4
SCECO Building EB - 028	Switchgear A + B – Panelboard 1	Normal	No Action	5
SCECO Building EB - 028	Switchgear A + B – Panelboard 1	Normal	No Action	6
SCECO Building EB - 028	Switchgear A + B – Panelboard 1	Normal	No Action	7
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	8
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	9
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	10
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	11
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	12
SCECO Building EB - 028	Switchgear A + B – Panelboard 3	Normal	No Action	13
SCECO Building EB - 028	Switchgear A + B – Panelboard 3	Normal	No Action	14
SCECO Building EB - 028	Switchgear A + B – Panelboard 3	Normal	No Action	15
SCECO Building EB - 028	Switchgear A + B – Panelboard 3	Normal	No Action	16
SCECO Building EB - 028	Switchgear A + B – Panelboard 3	Normal	No Action	17

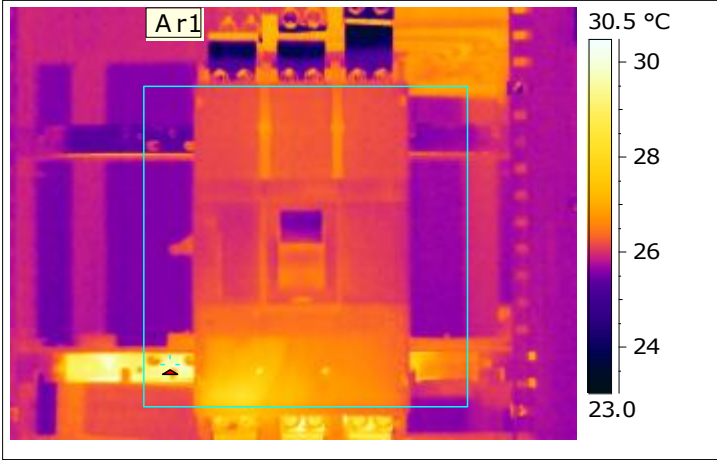


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 1

Image File Name	GR_0157.jpg
Image Date	11/10/2014
Image Time	10:44:12

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	29.9 °C
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Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70°C.

Reported by :

Engr. Adrian Arigo Signature:.....

date:10/11/2014

Repaired by:

date:

Comment:.....

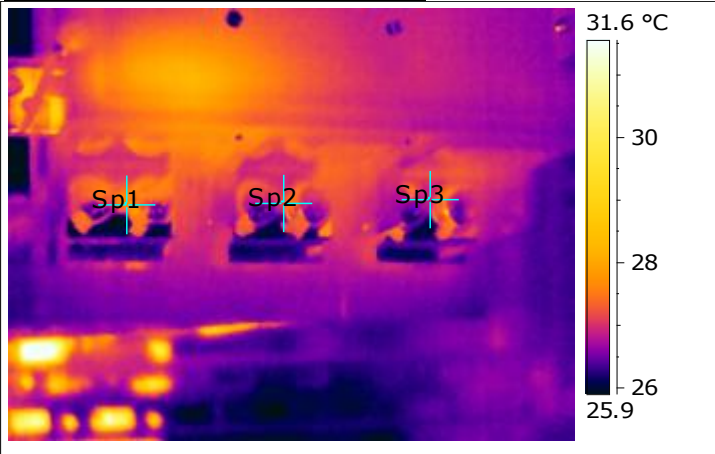


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 1

Image File Name	GR_0159.jpg
Image Date	11/10/2014
Image Time	10:44:56

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Sp1 Max. Temperature	27.6 °C
Sp2 Max. Temperature	27.2 °C
Sp3 Max. Temperature	26.9 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

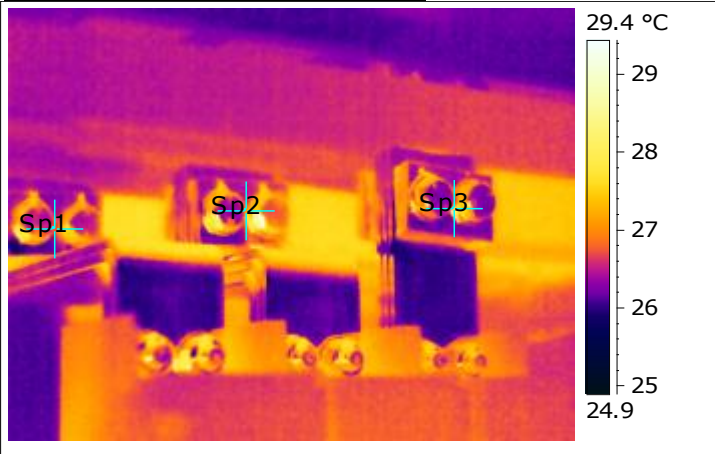


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 1

Image File Name	GR_0161.jpg
Image Date	11/10/2014
Image Time	10:45:11

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Sp1 Max. Temperature	26.7 °C
Sp2 Max. Temperature	27.4 °C
Sp3 Max. Temperature	28.2 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

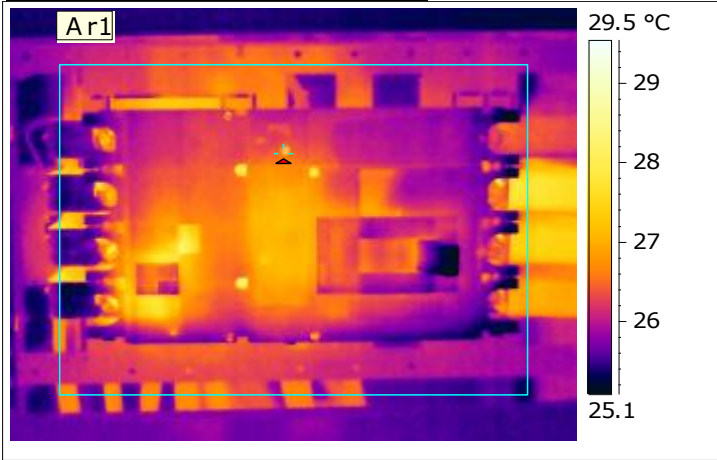


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 1

Image File Name	GR_0163.jpg
Image Date	11/10/2014
Image Time	10:45:33

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	29.1 °C
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Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70°C.

Reported by :

Engr. Adrian Arigo Signature:.....

date:10/11/2014

Repaired by:

date:

Comment:.....

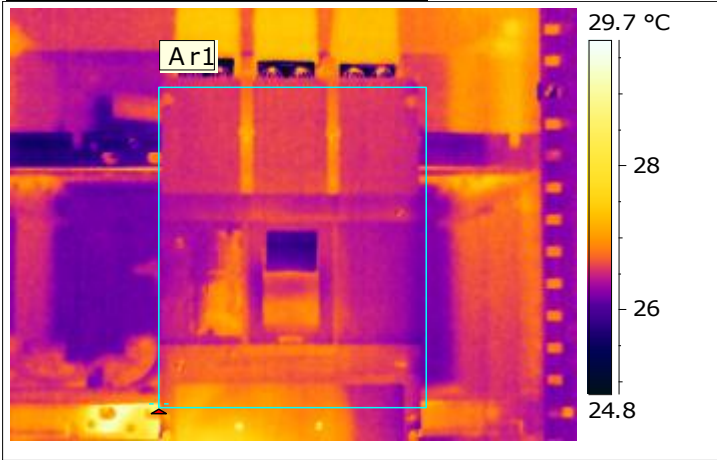


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 2

Image File Name	GR_0166.jpg
Image Date	11/10/2014
Image Time	10:47:41

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	28.4 °C
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Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

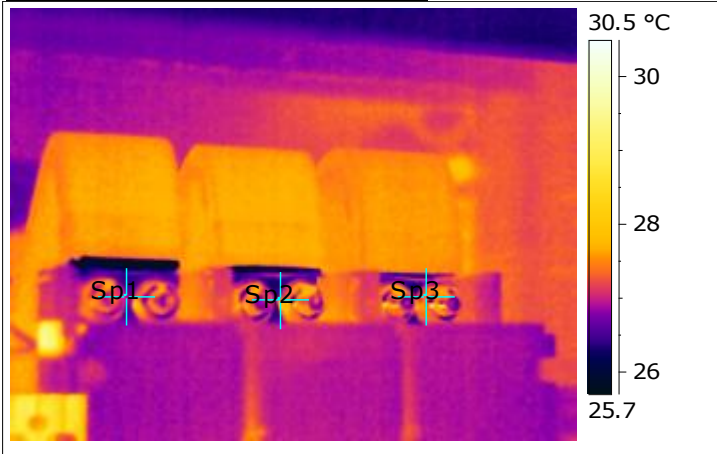


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 2

Image File Name	GR_0168.jpg
Image Date	11/10/2014
Image Time	10:48:04

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Sp1 Max. Temperature	26.9 °C
Sp2 Max. Temperature	27.7 °C
Sp3 Max. Temperature	27.5 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

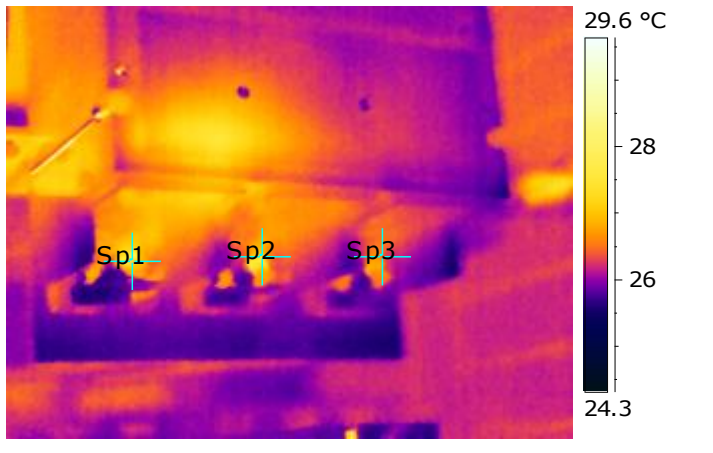


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**Thermography Inspection for Electrical Equipment
at

**Date:
10/11/2014**

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B - Panelboard 2

Image File Name	GR_0170.jpg
Image Date	11/10/2014
Image Time	10:48:52

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Sp1 Max. Temperature	27.2 °C
Sp2 Max. Temperature	27.9 °C
Sp3 Max. Temperature	26.4 °C

Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature:.....

date:10/11/2014

Repaired by:

date:

Comment:.....

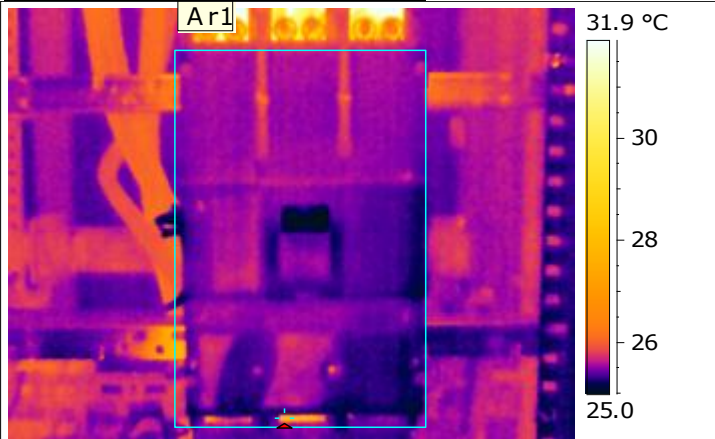


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 2

Image File Name	GR_0172.jpg
Image Date	11/10/2014
Image Time	10:49:17

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	28.7 °C
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Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:.....



WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 2

Image File Name	GR_0174.jpg
Image Date	11/10/2014
Image Time	10:49:45

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Sp1 Max. Temperature	26.0 °C
Sp2 Max. Temperature	25.9 °C
Sp3 Max. Temperature	25.9 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

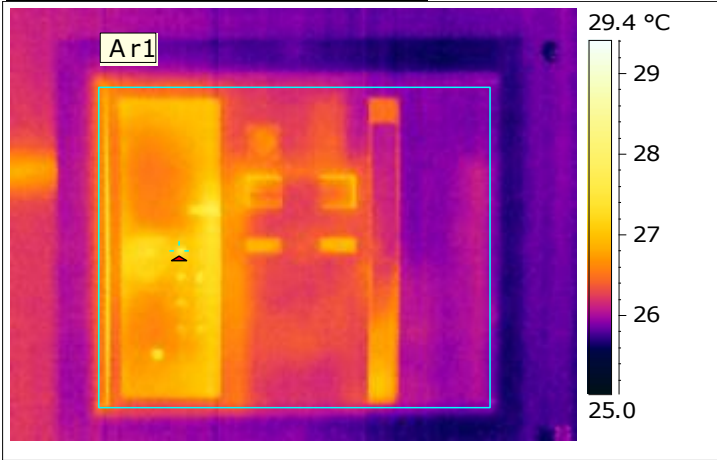


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

Image File Name	GR_0179.jpg
Image Date	11/10/2014
Image Time	10:51:55

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	28.6 °C
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Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

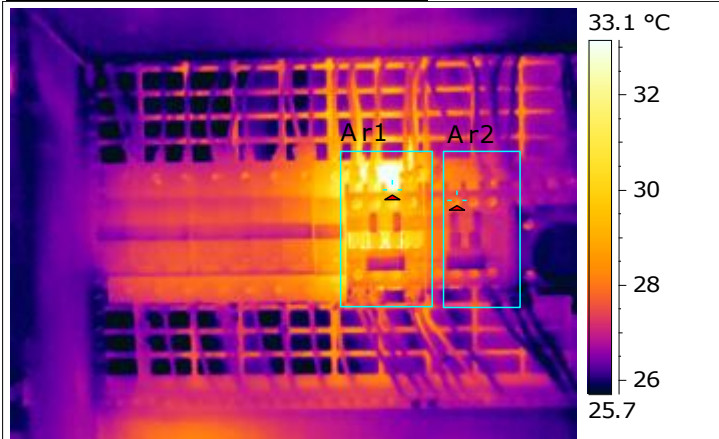


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

Image File Name	GR_0183.jpg
Image Date	11/10/2014
Image Time	10:54:51

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	38.2 °C
Ar2 Max. Temperature	29.6 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this magnetic contactor (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:



WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



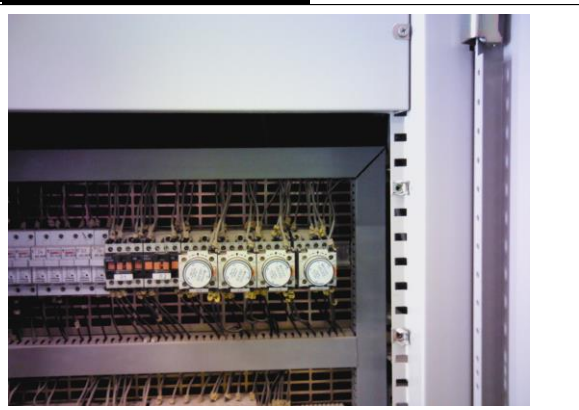
Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

Image File Name	GR_0185.jpg
Image Date	11/10/2014
Image Time	10:55:05

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	37.5 °C
Ar2 Max. Temperature	30.8 °C

Photo and Identification



Severity Rating & Recommendation			
1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this magnetic contactor (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

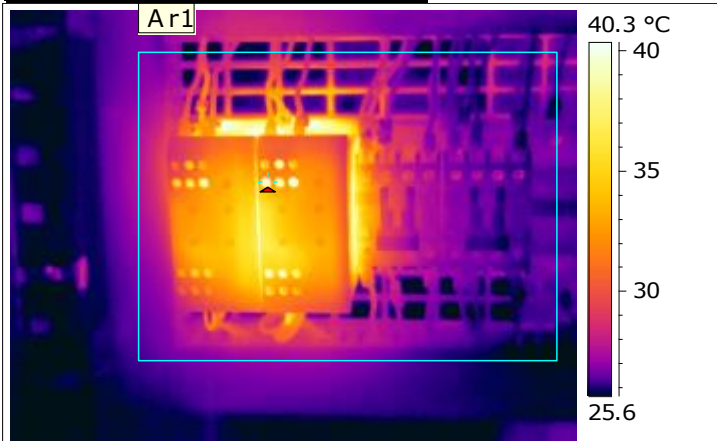


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
10/11/2014

Infrared Thermogram 11/10/2014



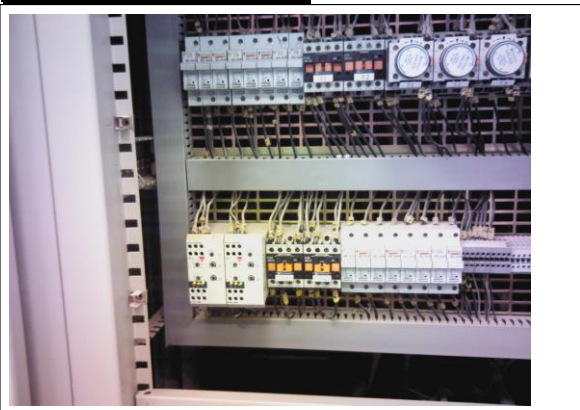
Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

Image File Name	GR_0187.jpg
Image Date	11/10/2014
Image Time	10:55:18

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	47.7 °C
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Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this miniature circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 50°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment:

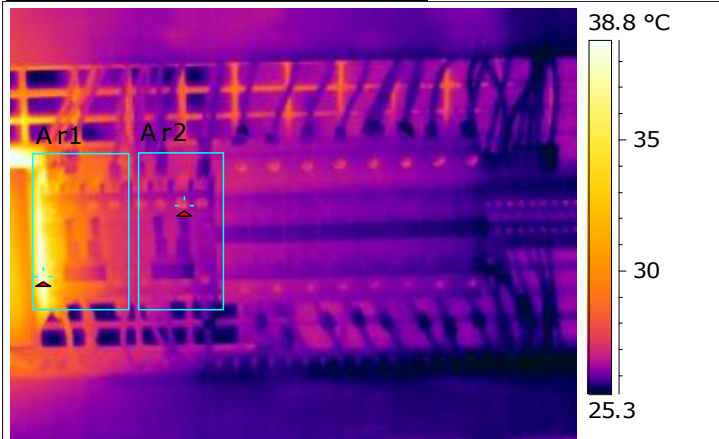


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
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Infrared Thermogram 11/10/2014



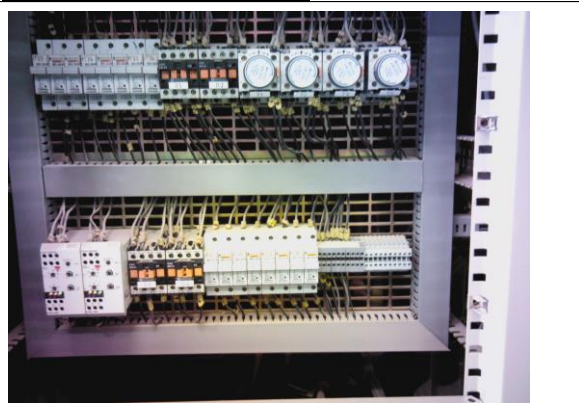
Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

Image File Name	GR_0189.jpg
Image Date	11/10/2014
Image Time	10:55:28

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.95
Object Distance	1.0 m

Ar1 Max. Temperature	39.6 °C
Ar2 Max. Temperature	29.2 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input type="checkbox"/>
2	Medium ($\Delta = 10-35^{\circ}\text{C}$)	Repair at schedule outage	<input type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

Corrective action:

In maximum load, this magnetic contactor (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 10/11/2014

Repaired by:

date:

Comment: