WESAM SYSTEMS

Thermal Inspection for Electrical Equipment

Using Advanced FLIR T640 Thermal Camera

For

Customer:********

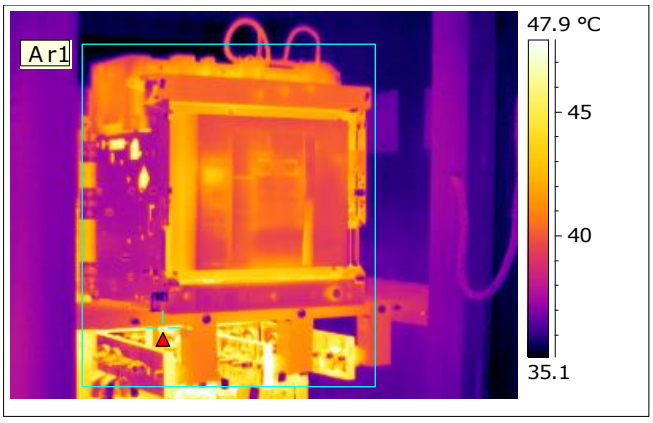
Location:********

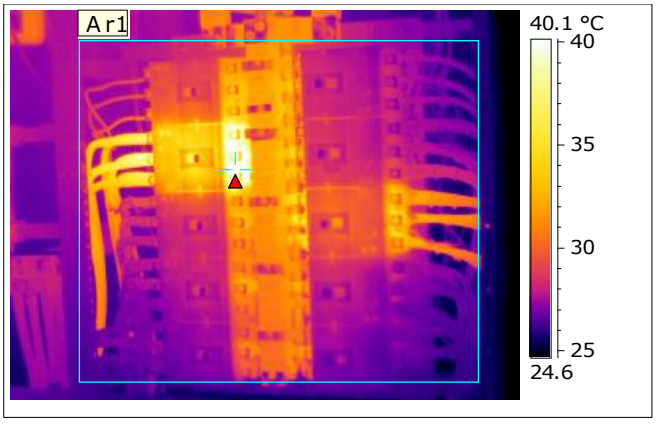
10/11/2014

By

Engr. Adrian Arigo

Associate Electrical Engineer, SCE
ITC Level 1 Thermographer





Inspection Site Information	
Customer	**********
Address	**********
Contact Person	**********
Mobile	**********
Email	**********
Thermographer	Eng. Ahmed Abu Alkhair
Phone number	0500463798
E-mail address	abu.alkhair@wesams.com

Tool used for the service:
Using Advanced FLIR T640 Thermal Camera

Engineer's Qualifications:
Engr. Adrian Arigo, ITC Level 1 Thermographer

Contact Details:
WESAM SYSTEMS Co. Ltd
Office # 803, Al-Jarbou Tower, Custodian of the Two Holy Mosques Rd., Al Aqrabiyah, Al-Khobar, Saudi Arabia

Phone: 0133616126

Email: info@wasamsys.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

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
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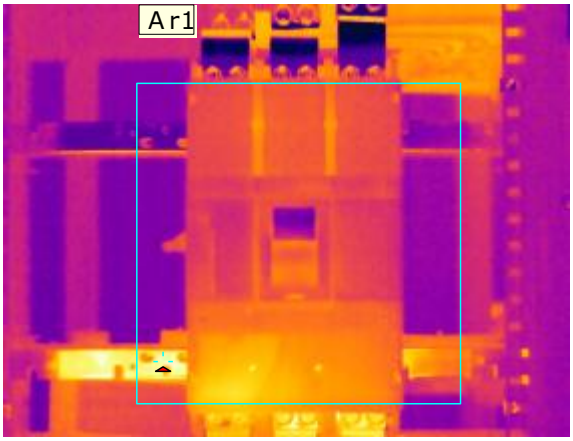
SCECO Building EB - 028	Switchgear A + B – Panelboard 1	Normal	No Action	7
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	8
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	9
SCECO Building EB - 028	Switchgear A + B – Panelboard 2	Normal	No Action	10
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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

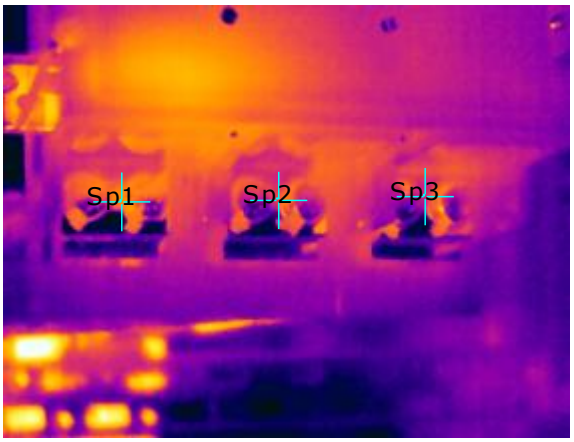
In maximum load, this main circuit breaker (Ar1 of thermal image) model reference temperature should not exceed 70ºC.

Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

Repaired by: ...…… date:

Comment:……..

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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

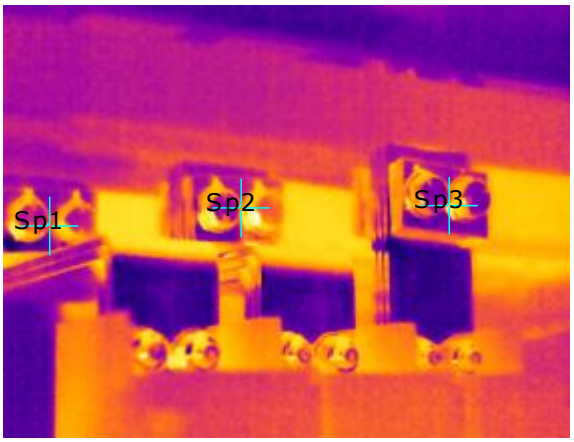
Reported by : **Engr. Adrian Arigo** Signature:……. date:**10/11/2014**

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_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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

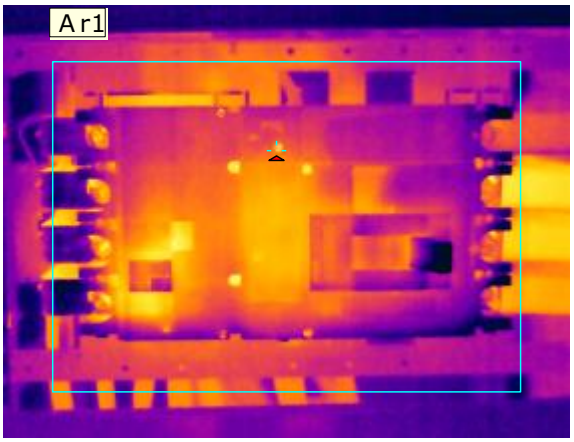
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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_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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

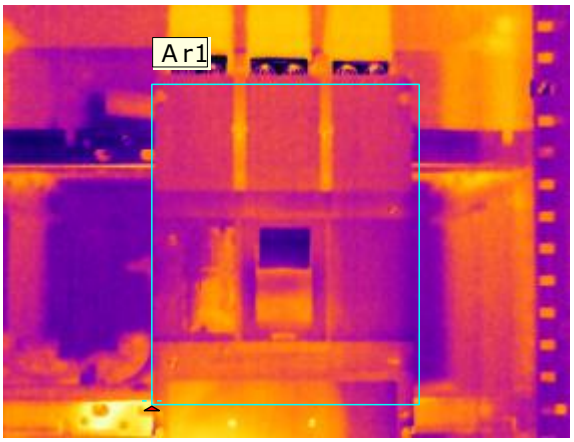
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

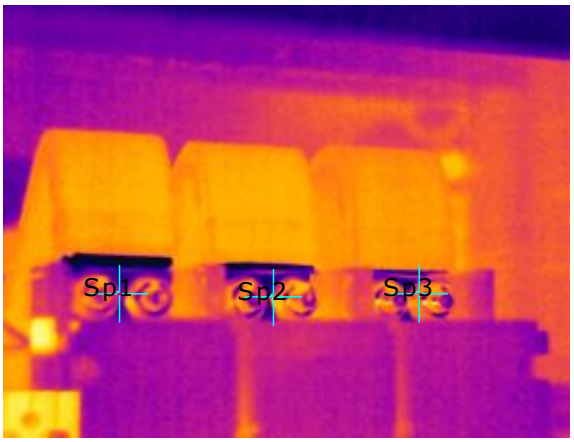
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

Repaired by: ...…… date:

Comment:……..

WESAM SYSTEMS	**Thermography Inspection for Electrical Equipment at ************	**Date: 10/11/2014**

Infrared Thermogram 11/10/2014



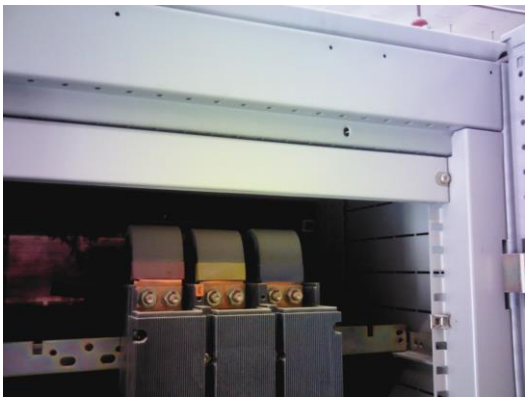
Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 2

Image File Name	GR_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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

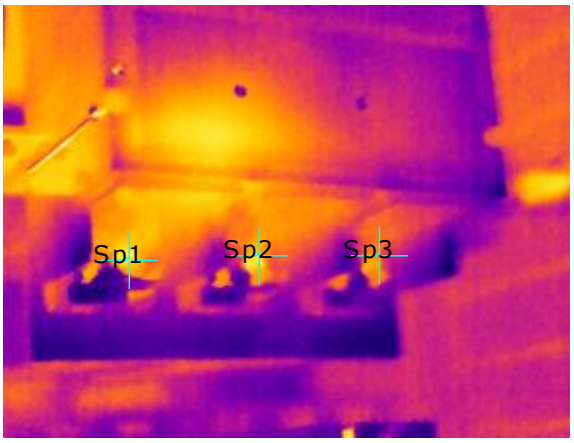
In maximum load, this connectors and terminations (Sp1 to Sp3 of thermal image) model reference temperature should not exceed 90ºC.

Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

Repaired by: ...…… date:

Comment:……..

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

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Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

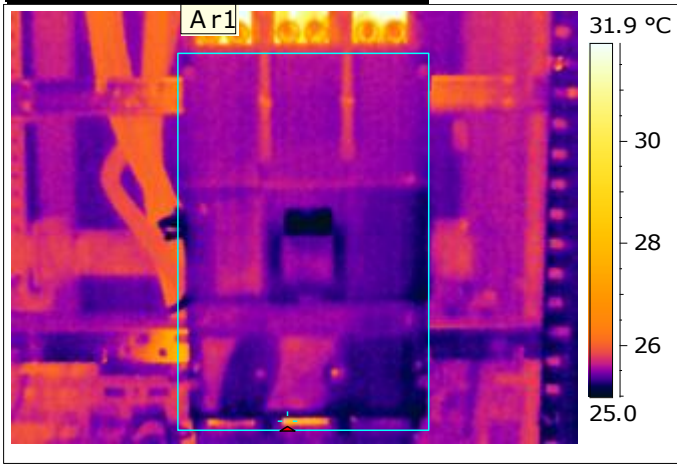
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

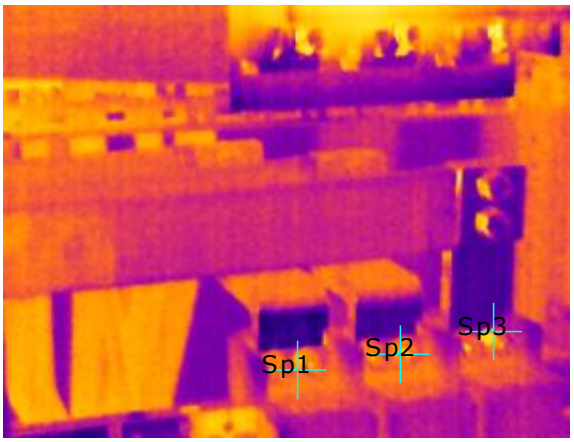
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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_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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

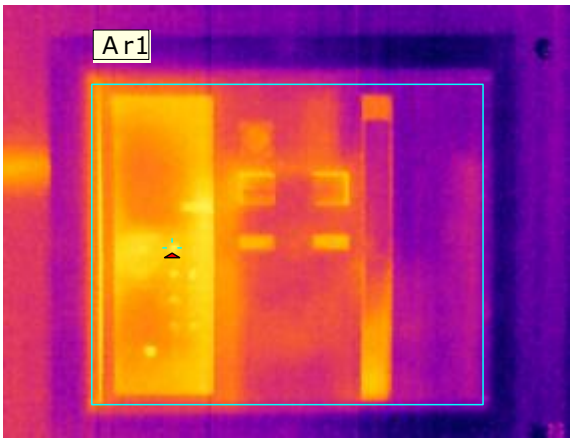
Reported by : **Engr. Adrian Arigo** Signature:……. date:**10/11/2014**

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 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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

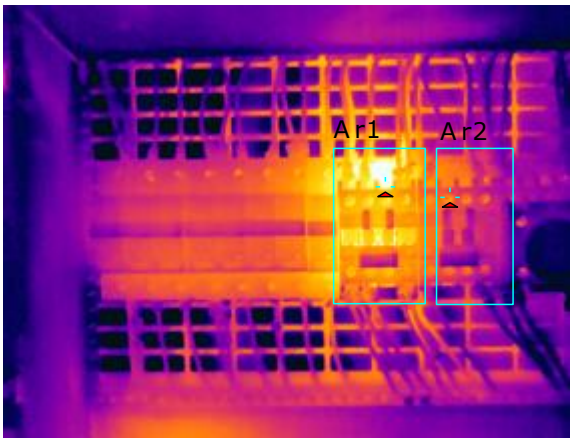
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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 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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

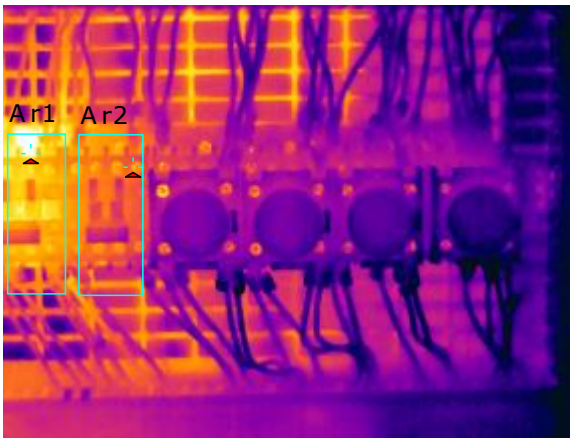
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

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 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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

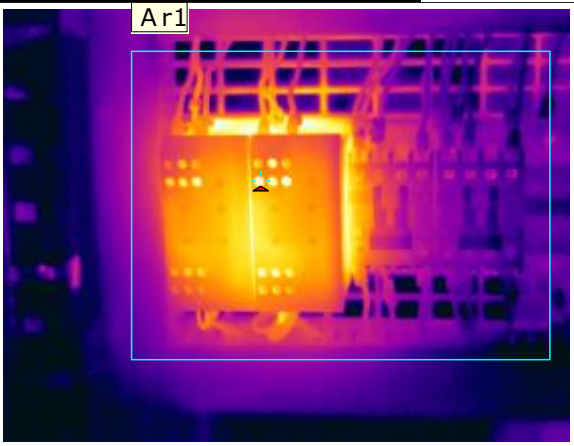
Reported by : **Engr. Adrian Arigo** Signature:……. date:**10/11/2014**

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 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

Photo and Identification

Severity Rating & Recommendation			
1	Low (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

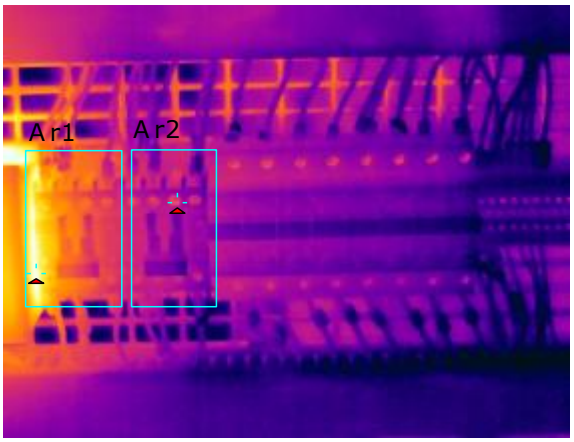
Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

Repaired by: ...…… date:

Comment:……..

WESAM SYSTEMS	**Thermography Inspection for Electrical Equipment at ************	**Date: 10/11/2014**

Infrared Thermogram 11/10/2014



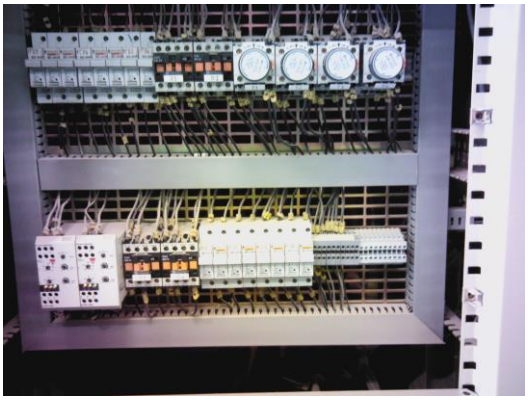
Location	SCECO Building EB - 028
Equipment	Switchgear A + B – Panelboard 3

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 (△= 5-10°C)	To be monitored	☐
2	Medium (△= 10-35°C)	Repair at schedule outage	☐
3	High (△> 35°C)	Repair immediately	☐

Analysis:

Corrective action:

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

Reported by : **Engr. Adrian Arigo** Signature:……..…… date:**10/11/2014**

Repaired by: ...…… date:

Comment:……..