



WESAM SYSTEMS

**Thermography Inspection for Electrical Equipment
at

**Date:
18/6/2014**



WESAM SYSTEMS

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

For

Customer: *****

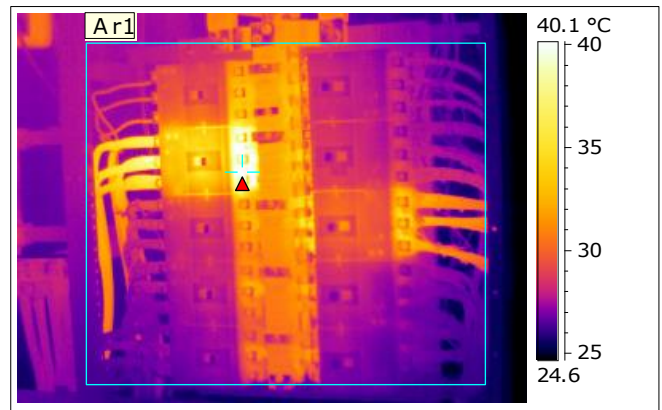
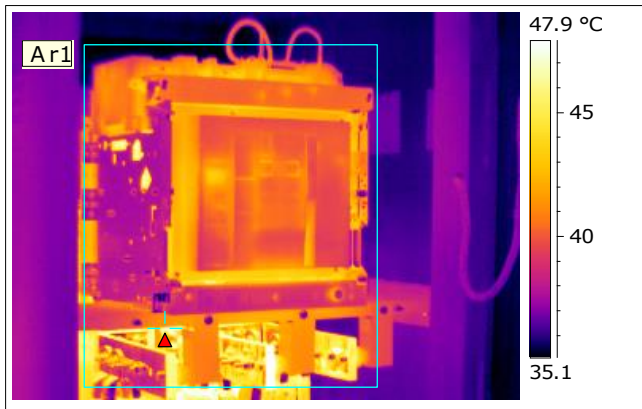
Location: *****

18/6/2014

By

Engr. Adrian Arigo

Associate Electrical Engineer, SCE





WESAM SYSTEMS

**Thermography Inspection for Electrical Equipment
at

**Date:
18/6/2014**

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



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Summary of Findings				
Location	Equipment	Fault	Recommendation	Page Number
South-Under Al-Safeyah Bridge	M-16	Medium Grade	Repair at schedule shutdown	4-5
South Al-Safeyah Garden	M-10	Low Grade	To be monitored – plan new inspection	6
South west-versus of dates market	M-6	Normal	No Action	7
South west –Under Al-Safeyah Bridge-Quba Signal	M-15	Normal	No Action	8-9
Al-Anbareyah-Under(Harbi Bridge or the 60 bridge)	The new panel	High	Repair immediately	10
The 60 Street-Al-Amarah-Versus of Marriott hotel	M-13	Medium Grade	Repair at schedule shutdown	11
South west-Near Abu Baker Al-seddeque mosque	M-5	Normal	No Action	12
West-Al-Salam Road-Wasel Al-Thahabe	M-12	Normal	No Action	13

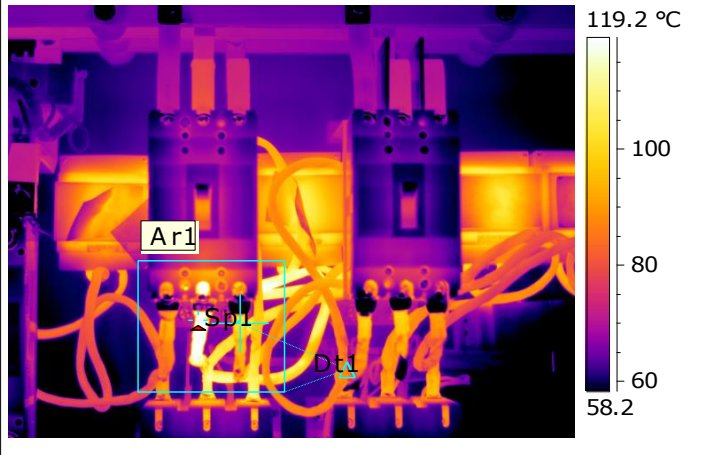


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Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



Location	South Under Al-Safeyah Bridge
Equipment	M-16

Image File Name	FLIR0586.jpg
Image Date	06/18/2014
Image Time	7:10:13

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	136.9 °C
Sp1 Max. Temperature	102.2 °C
Dt1 Value	34.7 °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 checked="" type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

The detected hot spot in thermal image shown above were many critical faults in filters and cables (Ar1) which are high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

To check the loading current (in Amperes) of the secondary load side wire of the circuit breaker (S phase)
Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature:.....

date:18/6/2014

Repaired by:

date:

Comment:.....

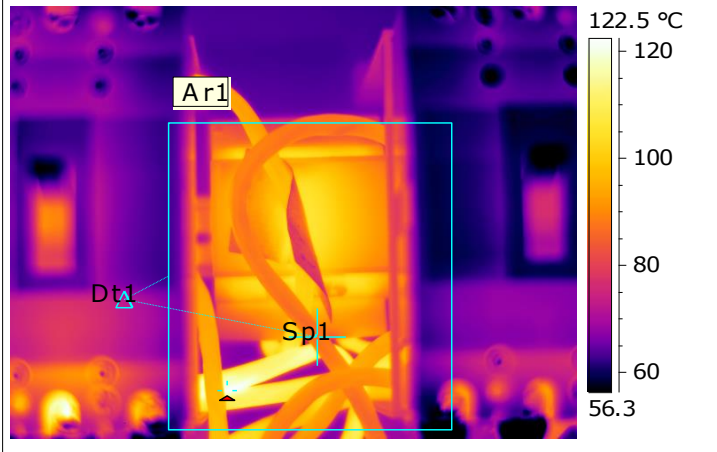


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Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



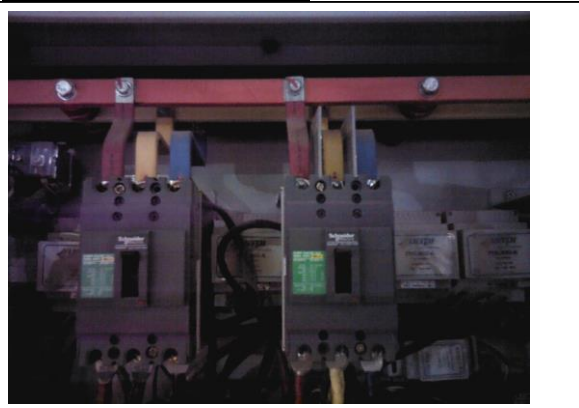
Location	South Under Al-Safeyah Bridge
Equipment	M-16

Image File Name	FLIR0589.jpg
Image Date	06/18/2014
Image Time	7:11:31

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	122.5 °C
Sp1 Max. Temperature	87.0 °C
Dt1 Value	35.5 °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 checked="" type="checkbox"/>

Analysis:

The detected hot spot in thermal image shown above were many critical faults in filters and cables (Ar1) which are high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

To checked the loading current (in Amperes) of the secondary load side wire of the circuit breaker (S phase)
Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 18/6/2014

Repaired by:

date:

Comment:

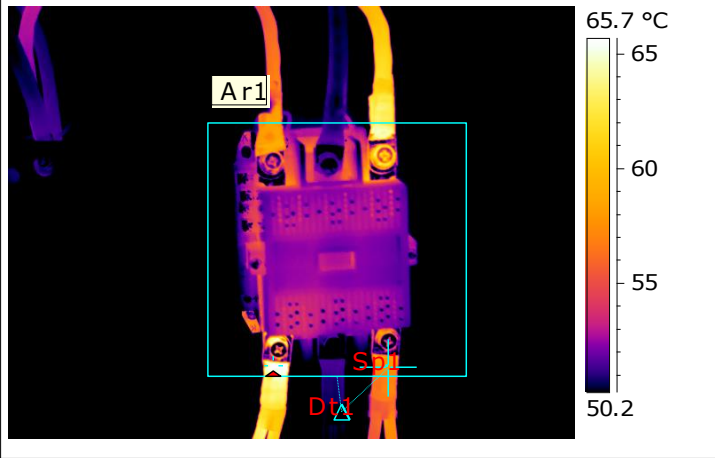


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Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



Location	South Al-Safeyah Garden
Equipment	M-10

Image File Name	FLIR0593.jpg
Image Date	06/18/2014
Image Time	7:16:50

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	65.9 °C
Sp1 Max. Temperature	57.8 °C
Dt1 Value	8.2 °C

Photo and Identification



Severity Rating & Recommendation

1	Low ($\Delta = 5-10^{\circ}\text{C}$)	To be monitored	<input checked="" 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:

The detected hot spot in thermal image shown above was the secondary load side wire of the magnetic contactor (R phase) (Ar1) which is high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

It is recommended to keep it under monitoring and to checked the load current in R phase of the contactor
Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature: *Adrian Arigo*

date: 18/6/2014

Repaired by:

date:

Comment:.....

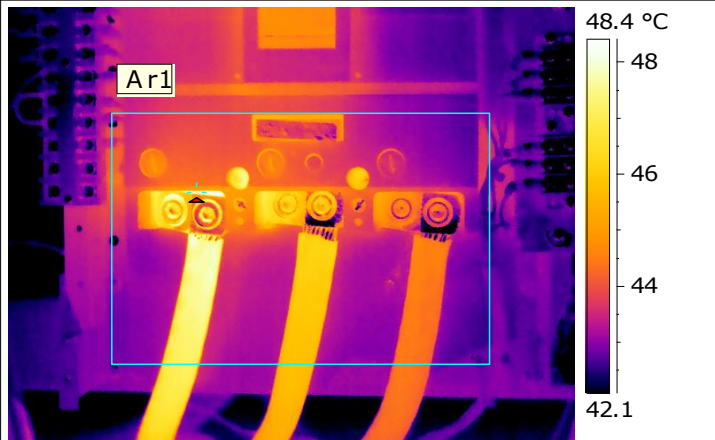


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Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



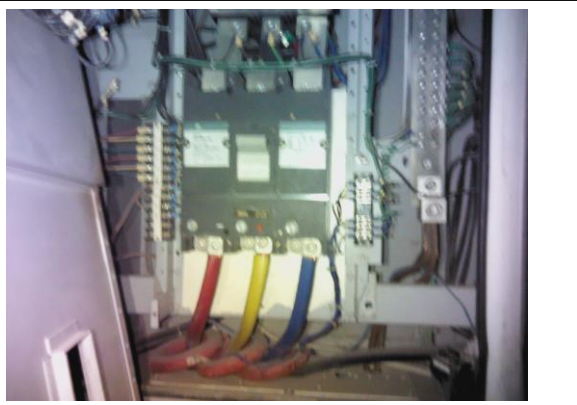
Location	South West-Versus of Dates Market
Equipment	M-6

Image File Name	FLIR0601.jpg
Image Date	06/18/2014
Image Time	7:31:05

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	48.4 °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, connectors and terminations (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date:18/6/2014

Repaired by:

date:

Comment:.....

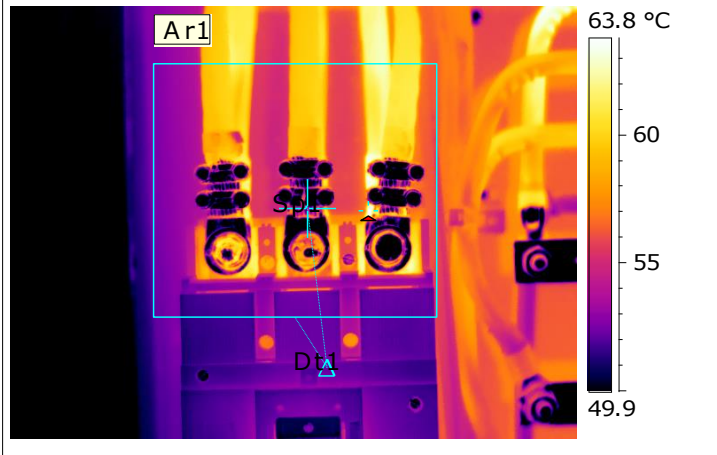


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Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



Location	South West-Under Al-Safeyah Bridge-Quba Signal
Equipment	M-15

Image File Name	FLIR0606.jpg
Image Date	06/18/2014
Image Time	7:40:13

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	63.9 °C
Sp1 Max. Temperature	54.5 °C
Dt1 Value	9.4 °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 (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 18/6/2014

Repaired by:

date:

Comment:.....

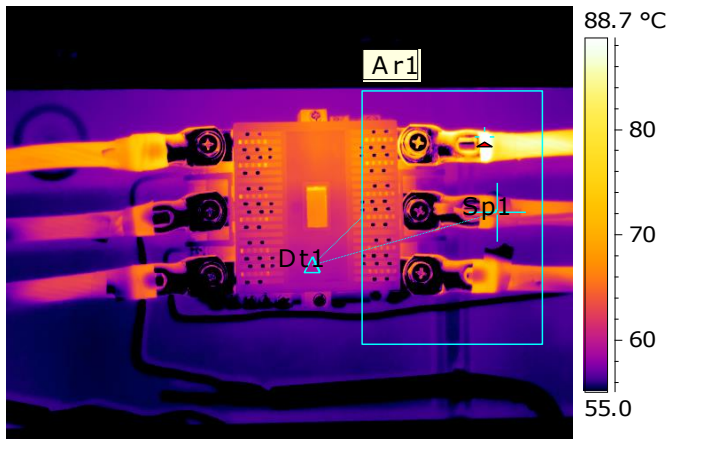


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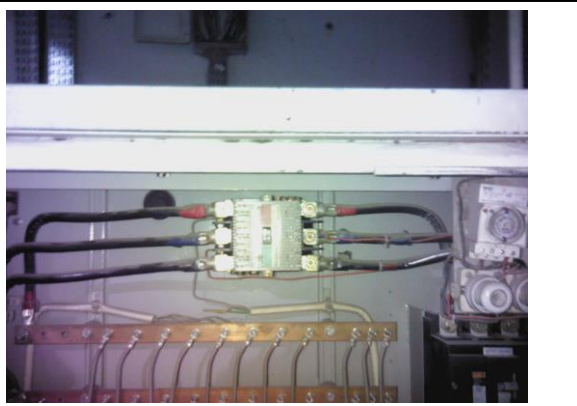
Location	South West-Under Al-Safeyah Bridge-Quba Signal
Equipment	M-15

Image File Name	FLIR0611.jpg
Image Date	06/18/2014
Image Time	7:42:08

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	91.9 °C
Sp1 Max. Temperature	64.2 °C
Dt1 Value	27.7 °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 checked="" type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

The detected hot spot in thermal image shown above was the secondary load side wire of the magnetic contactor (T phase) (Ar1) which is high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

- To check the loading current of the secondary load side wire of the contactor (T phase)
- To check all cable terminations
- Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature:.....

date:18/6/2014

Repaired by:

date:

Comment:.....

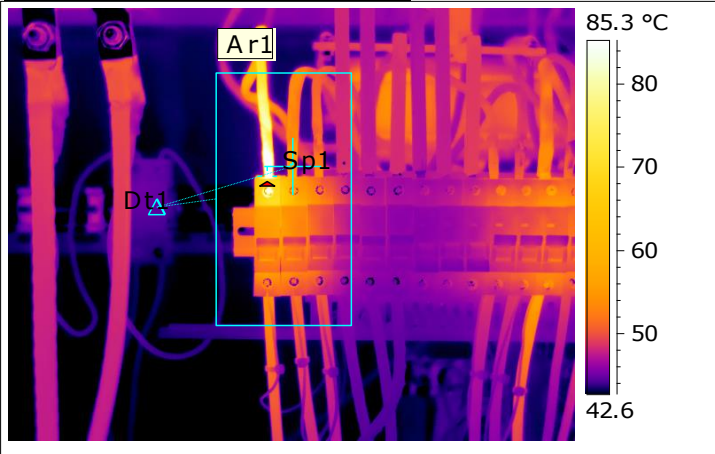


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Thermography Inspection for Electrical Equipment at *****

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18/6/2014

Infrared Thermogram 6/18/2014



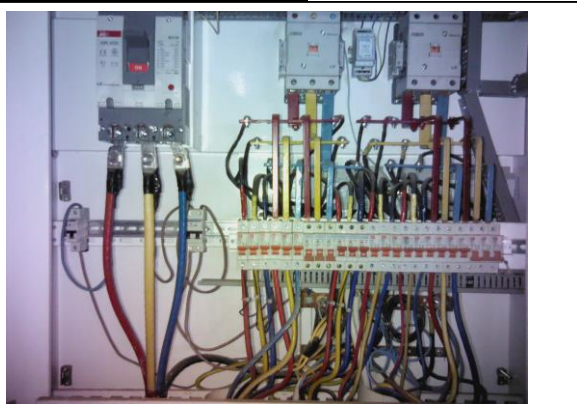
Location	Al-Anbareyah-Under(Harbi Bridge or the 60 bridge)
Equipment	The new panel

Image File Name	FLIR0616.jpg
Image Date	06/18/2014
Image Time	7:49:27

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	95.6 °C
Sp1 Max. Temperature	57.6 °C
Dt1 Value	38.1 °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 checked="" type="checkbox"/>

Analysis:

The detected hot spot in thermal image shown above was the secondary load side wire of the miniature circuit breaker (R phase) (Ar1) which is high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

- To check the loading current of the secondary load side wire of the contactor (R phase)
- To check all cable terminations
- Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature: *Adrian Arigo*

date:18/6/2014

Repaired by:

date:

Comment:.....

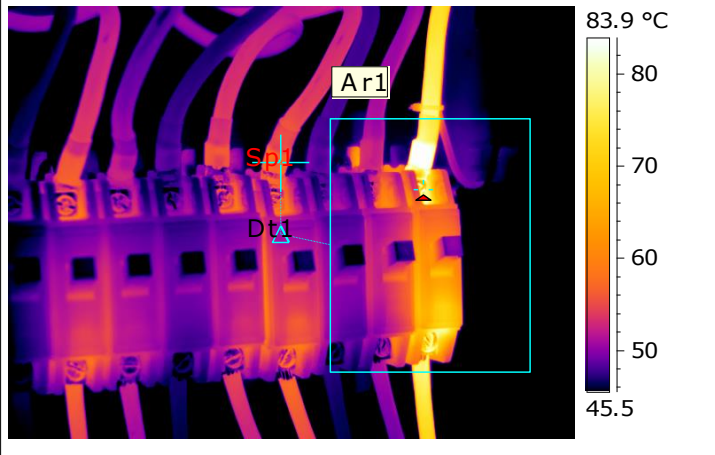


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Infrared Thermogram 6/18/2014



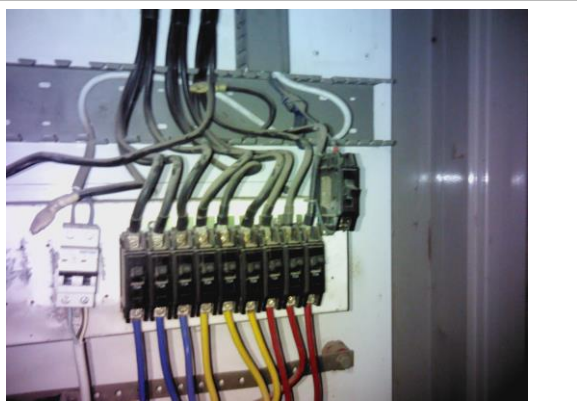
Location	The 60 Street-Al-Amarah-Versus of Marriott hotel
Equipment	M-13

Image File Name	FLIR0626.jpg
Image Date	06/18/2014
Image Time	7:56:34

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	84.9 °C
Sp1 Max. Temperature	56.6 °C
Dt1 Value	28.3 °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 checked="" type="checkbox"/>
3	High ($\Delta > 35^{\circ}\text{C}$)	Repair immediately	<input type="checkbox"/>

Analysis:

The detected hot spot in thermal image shown above was the secondary load side wire of the miniature circuit breaker (T phase) (Ar1) which is high in temperature.

Corrective action:

In maximum load, this insulated conductor, enclosure surface (Ar1 of thermal image) model reference temperature should not exceed 50°C.

- To check the loading current of the secondary load side wire of the contactor (T phase)
- To check all cable terminations
- Do another thermal inspection

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 18/6/2014

Repaired by:

date:

Comment:

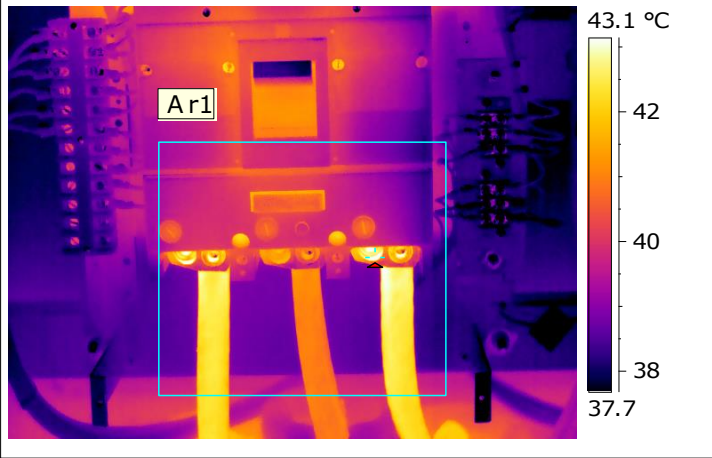


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infrared Thermogram 6/18/2014



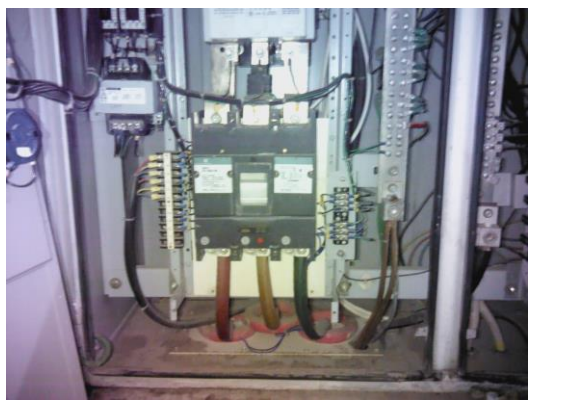
Location	South west-Near Abu Baker Al-seddeque mosque
Equipment	M-13

Image File Name	FLIR0631.jpg
Image Date	06/18/2014
Image Time	8:04:04

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	43.5 °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 connectors and terminations (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by :

Engr. Adrian Arigo Signature: *Arigo*

date: 18/6/2014

Repaired by:

date:

Comment:.....

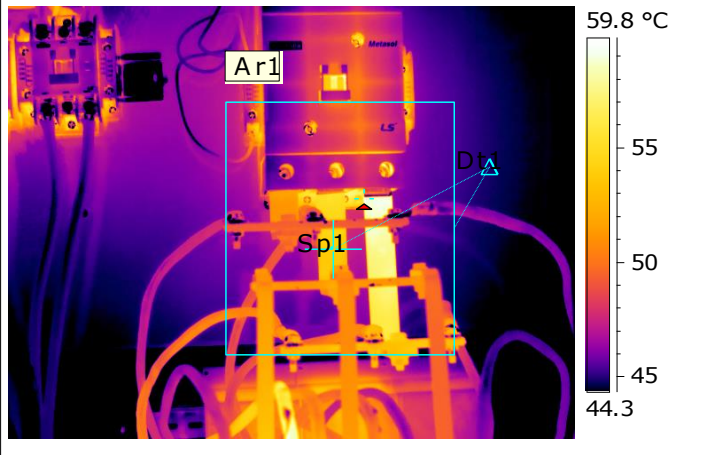


WESAM SYSTEMS

Thermography Inspection for Electrical Equipment at *****

Date:
18/6/2014

Infraed Thermogram 6/18/2014



Location	West-Al-Salam Road- Wasel Al-Thahabe
Equipment	M-12

Image File Name	FLIR0641.jpg
Image Date	06/18/2014
Image Time	8:09:42

Atmospheric Temperature	20.0 °C
Relative Humidity	50%
Emissivity	0.90
Object Distance	1.0 m

Ar1 Max. Temperature	59.1 °C
Sp1 Max. Temperature	53.8 °C
Dt1 Value	5.3 °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 (Ar1 of thermal image) model reference temperature should not exceed 90°C.

Reported by : Engr. Adrian Arigo Signature:.....

date:18/6/2014

Repaired by:

date:

Comment:.....