



Infrared Survey Of TERWANDARY PTY LTD For BRYCE WOLFF

CUSTOMER / SITE: Terwandary PTY LTD

ADDRESS: 550a Alderley St Toowoomba

THERMOGRAPHY DATE: 13/08/2018

THERMOGRAPHER: Ben Martin





AINDT

**AUSTRALIAN INSTITUTE
FOR
NON-DESTRUCTIVE TESTING**

A.B.N. 21 005 040 835

Michael Reiken

IS CERTIFIED IN ACCORDANCE WITH
ISO18436:2004
FOR
Thermography

| | |
|-------------------|------------|
| CATEGORY | I |
| INDUSTRIAL SECTOR | General |
| REGISTRATION NO. | 2289 |
| ISSUE DATE | 16/09/2015 |
| EXPIRY DATE | 16/09/2020 |
| ISSUE NUMBER | 1 |



JAS-ANZ



WWW.JAS-ANZ.ORG/REGISTER

[Signature]
FEDERAL PRESIDENT

[Signature]
CHAIRMAN

CM CERTIFICATION BOARD

This certificate remains the property
of AINDT Certification Board



An Infrared Thermal Inspection was performed at the site noted on the preceding Title Page.

EXECUTIVE SUMMARY

PLANT INSPECTED

All of the facilities examined during this visit are listed on the following page.

FOLLOW UP INSPECTION

We would recommend further Infrared Thermal Inspections at twelve (12) monthly intervals. This will assist you with the effective maintenance and reduction of unscheduled outages and failure of your facilities.

We thank you for the opportunity to carry out the Infrared Thermal Inspection and look forward to a continued mutually beneficial association.

MICHAEL REIKEN

Level 1 Thermographer (RMIT) Electrical Fitter Mechanic (C15868) Electrical Contractor (69356)
AINDT Member No 2289.

Fault Diagnosis – Criteria

| Rating | Δ Temp | Recommendations |
|----------|---------------|--|
| low | 0 to 10°C | Possible deficiency and warrants further monitoring. |
| moderate | 10 to 20°C | Indicates deficiency; repair as time permits. |
| high | 20 to 40°C | Corrective measures required ASAP. |
| extreme | 40° and above | Corrective measures required immediately |

Report Guidelines – General

This report has been prepared in accordance with the “Guideline for Infrared Inspections of Electrical and Mechanical Systems” First Edition, Copyright 1993 Infrasppection Institute Inc.

The subsequent delta T (temperature difference) criteria applied to evaluate the temperature severity of an exception, is the “Experienced-based” criteria for electrical and/or mechanical equipment.

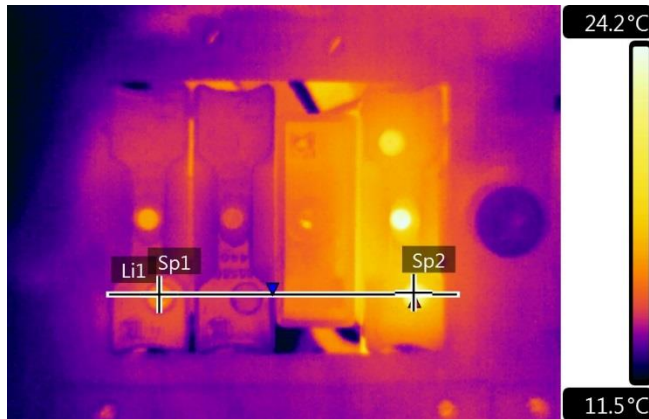
This report is designed to caution against temperature anomalies and/or exceptions that may indicate the possible deterioration or failure of a component or system. It is not a guarantee against failure, nor is it a quantitative measure of deterioration or malfunction. This report serves only as an indication of an exception which may or may not lead to deterioration or failure. It is the responsibility of the contracted end user to resolve the diagnosis and determine any corrective measures, if required. Excel Power is not responsible for determining fault diagnosis or rectification procedures, and as such, it is recommended that all faults be investigated by qualified personnel of the end user.

In no event shall Excel Power be liable to anyone for special, collateral, incidental or consequential damages in conjunction with or arising from the use of this survey



SUMMARY

| Image Date | Barcode | Location | Object ID | Fault Rating | Page Number |
|------------|----------|--|-----------------------------------|--------------|-------------|
| 13/08/2018 | 00000541 | SITE 4, SOUTH EASTERN SIDE OF SHED | DB 4 MISSING FUSE COVER | LOW | 5 |
| 13/08/2018 | 00000548 | SITE 4 | MAIN SWITCHBOARD | LOW | 6 |
| 13/08/2018 | | SITE 2, OUTSIDE LUNCHROOM | THREE PHASE AC BREAKER | LOW | 7 |
| 13/08/2018 | 00000560 | SITE 2 | MAIN SWITCH | NONE | 8 |
| 13/08/2018 | 00000558 | SITE 3 | MAIN SWITCH | NONE | 9 |
| 13/08/2018 | 00000559 | SITE 3 | DB 3. CIRCUIT 10 | LOW | 10 |
| 13/08/2018 | 00000558 | SITE 3 | DB 2, CIRCUITS 10,11,12 | LOW | 11 |
| 13/08/2018 | 00000555 | SITE 5 | MAIN SWITCHBOARD BREAKER 14,16,18 | HIGH | 12 |
| 13/08/2018 | | SITE 1, WESTERN SIDE, MIDDLE OF THE SHED | K1 CONTACTOR | LOW | 13 |
| 13/08/2018 | | SITE 1, EASTERN SIDE, MIDDLE OF THE SHED | DB WY2 | LOW | 14 |
| 13/08/2018 | | SITE 1, MAIN SWITCHBOARD | K1 CONTACTOR | LOW | 15 |
| 13/08/2018 | | SITE 1, MAIN SWITCHBOARD | MAIN SWITCH | NONE | 16 |



IR_6927.jpg | 13/08/2018 | 8:36 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6927.jpg |
| Image Date&Time | 13/08/2018 8:36:08 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Sp1 | 15.5 °C |
| Sp2 | 23.0 °C |
| Li1 Maximum | 23.0 °C |
| Li1 Minimum | 13.1 °C |

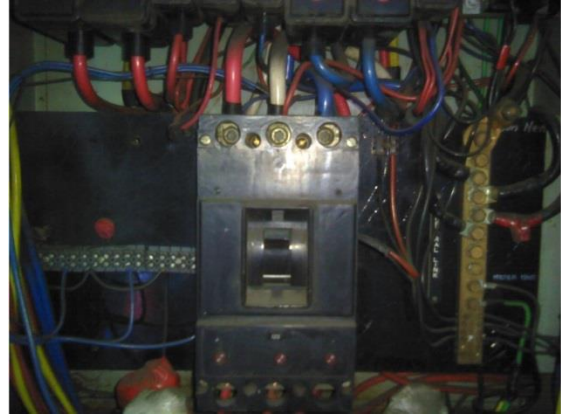
| | |
|-------------------|------------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000541 |
| Location | SITE 4, SOUTH EASTERN SIDE OF SHED |
| Object ID | DB 4 MISSING FUSE COVER |
| Fault Description | EXPOSED LIVE PARTS |
| Fault Rating | LOW |
| Remedy | REPLACE FUSE/ COVER FUSE HOLDER |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

Corrective Action

Date

Repaired by:



IR_6931.jpg | 13/08/2018 | 8:48 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6931.jpg |
| Image Date&Time | 13/08/2018 8:48:13 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Sp1 | 17.8 °C |
| Sp2 | 19.8 °C |
| Sp3 | 25.2 °C |
| Li1 Maximum | 25.3 °C |
| Li1 Minimum | 10.2 °C |

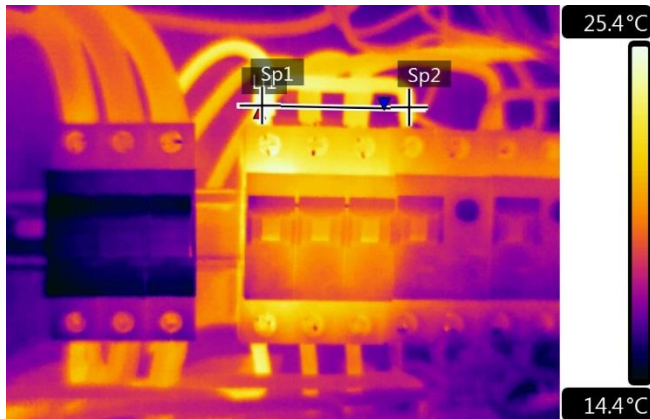
| | |
|-------------------|--|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000548 |
| Location | SITE 4 |
| Object ID | MAIN SWITCHBOARD |
| Fault Description | POSSIBLE POOR CONNECTIONS OR UNBALANCED LOAD |
| Fault Rating | LOW |
| Remedy | CHECK CONNECTIONS AND LOADING BETWEEN PHASES |
| Thermographer | BRENDAN RADLEY |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

Corrective Action

Date

Repaired by:



IR_6933.jpg | 13/08/2018 | 9:00 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6933.jpg |
| Image Date&Time | 13/08/2018 9:00:10 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Sp1 | 25.1 °C |
| Sp2 | 22.9 °C |
| Li1 Maximum | 25.2 °C |
| Li1 Minimum | 17.1 °C |

| | |
|-------------------|--|
| Company | TERWANDARY PTY LTD |
| Barcode | |
| Location | SITE 2, OUTSIDE LUNCHROOM |
| Object ID | THREE PHASE AC BREAKER |
| Fault Description | POSSIBLE POOR CONNECTION OR UNBALANCED LOAD |
| Fault Rating | LOW |
| Remedy | CHECK CONNECTIONS AND LOADING BETWEEN PHASES |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

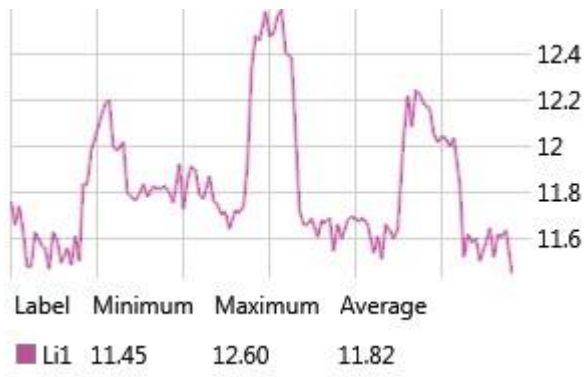
Corrective Action

Date

Repaired by:



IR_6935.jpg | 16/08/2018 | 7:38 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6935.jpg |
| Image Date&Time | 16/08/2018 7:38:04 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 12.6 °C |
| Li1 Minimum | 11.5 °C |

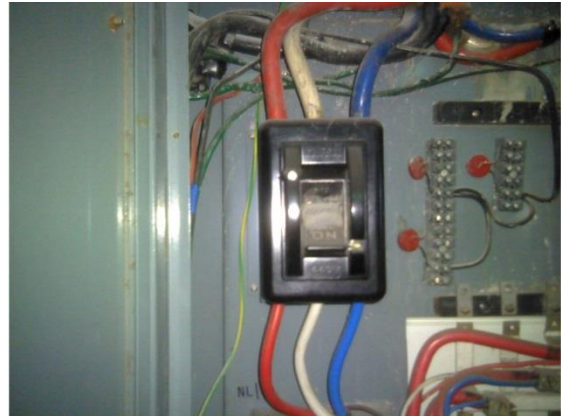
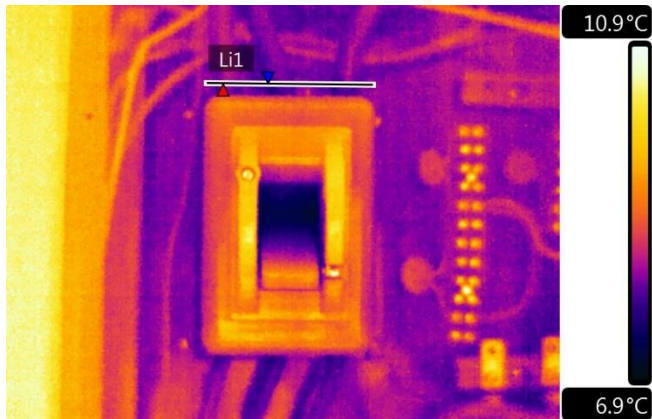
| | |
|-------------------|----------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000560 |
| Location | SITE 2 |
| Object ID | MAIN SWITCH |
| Fault Description | NO FAULT FOUND |
| Fault Rating | NONE |
| Remedy | MAINTAIN REGULAR THERMAL IMAGING |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

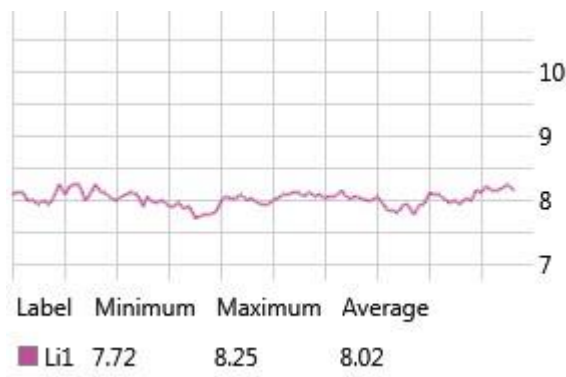
Corrective Action

Date

Repaired by:



IR_6937.jpg | 13/08/2018 | 9:31 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6937.jpg |
| Image Date&Time | 13/08/2018 9:31:20 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 8.2 °C |
| Li1 Minimum | 7.7 °C |

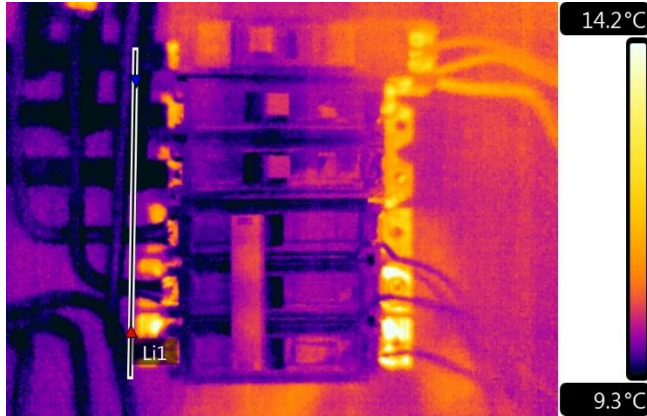
| | |
|-------------------|----------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000558 |
| Location | SITE 3 |
| Object ID | MAIN SWITCH |
| Fault Description | NO FAULT FOUND |
| Fault Rating | NONE |
| Remedy | MAINTAIN REGULAR THERMAL IMAGING |
| Thermographer | BEN MARTIN |

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|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

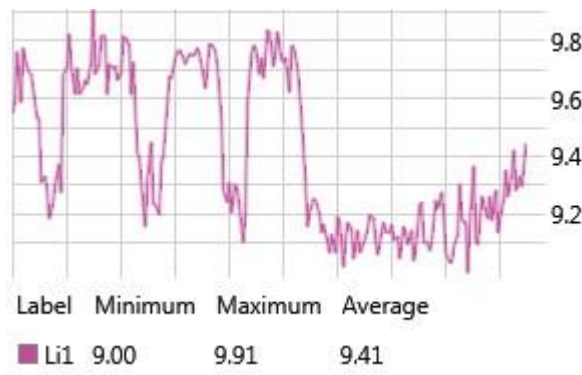
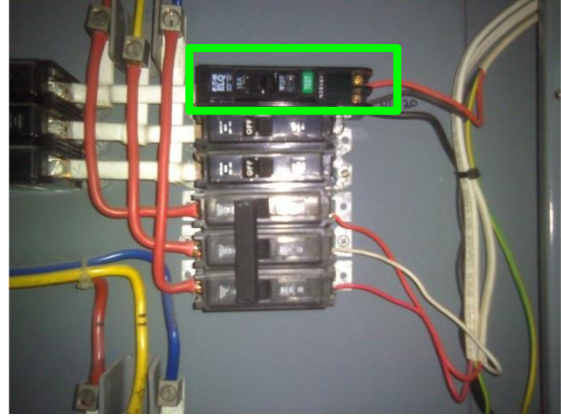
Corrective Action

Date

Repaired by:



IR_6939.jpg | 16/08/2018 | 7:38 AM



| | |
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| File Name | IR_6939.jpg |
| Image Date&Time | 16/08/2018 7:38:04 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 9.9 °C |
| Li1 Minimum | 9.0 °C |

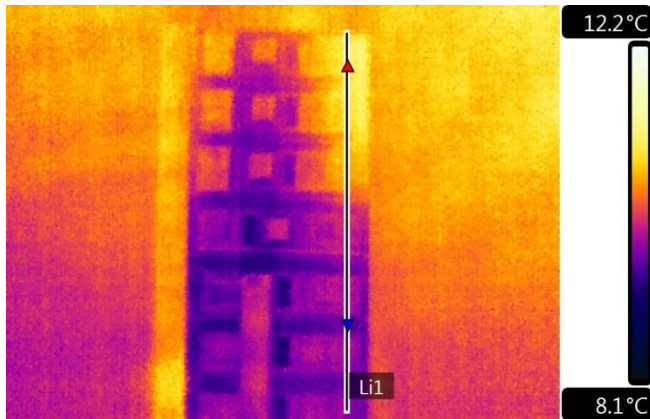
| | |
|-------------------|--------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000559 |
| Location | SITE 3 |
| Object ID | DB 3. CIRCUIT 10 |
| Fault Description | RCBOs RECALLED BY MANUFACTURER |
| Fault Rating | LOW |
| Remedy | REPLACE EATON RCBOs |
| Thermographer | BEN MARTIN |

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|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

Corrective Action

Date

Repaired by:



IR_6941.jpg | 16/08/2018 | 7:38 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6941.jpg |
| Image Date&Time | 16/08/2018 7:38:03 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 11.0 °C |
| Li1 Minimum | 9.4 °C |

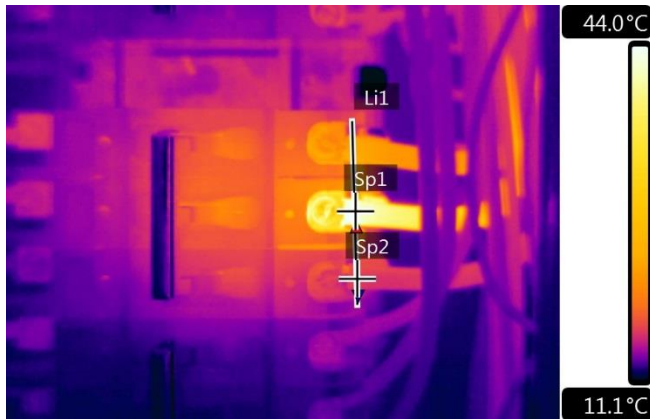
| | |
|-------------------|--------------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | 00000558 |
| Location | SITE 3 |
| Object ID | DB 2, CIRCUITS 10,11,12 |
| Fault Description | EATON RCBOs RECALLED BY MANUFACTURER |
| Fault Rating | LOW |
| Remedy | REPLACE RECALLED RCBOs |
| Thermographer | BEN MARTIN |

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|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

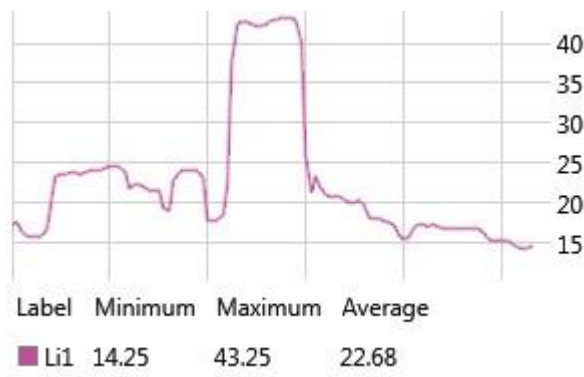
Corrective Action

Date

Repaired by:



IR_6943.jpg | 16/08/2018 | 7:38 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6943.jpg |
| Image Date&Time | 16/08/2018 7:38:03 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Sp1 | 42.2 °C |
| Sp2 | 16.6 °C |
| Li1 Maximum | 43.3 °C |
| Li1 Minimum | 14.3 °C |

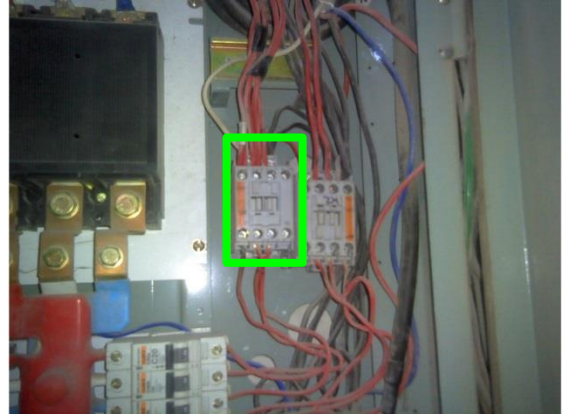
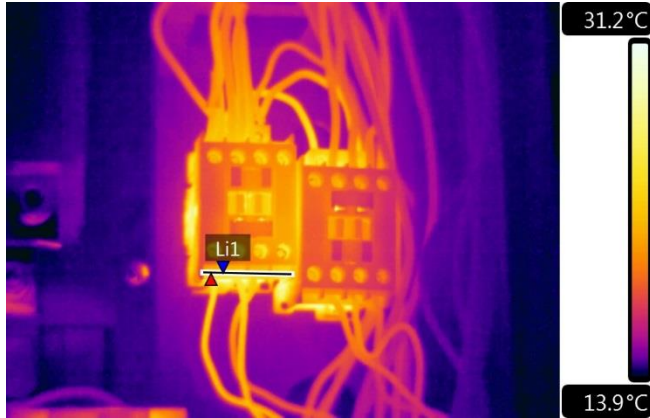
| | |
|-------------------|--|
| Barcode | 00000555 |
| Company | TERWANDARY PTY LTD |
| Location | SITE 5 |
| Object ID | MAIN SWITCHBOARD BREAKER 14,16,18 |
| Fault Description | POSSIBLE POOR CONNECTION OR UNBALANCED LOAD |
| Fault Rating | HIGH |
| Remedy | CHECK CONNECTIONS AND LOADING BETWEEN PHASES |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

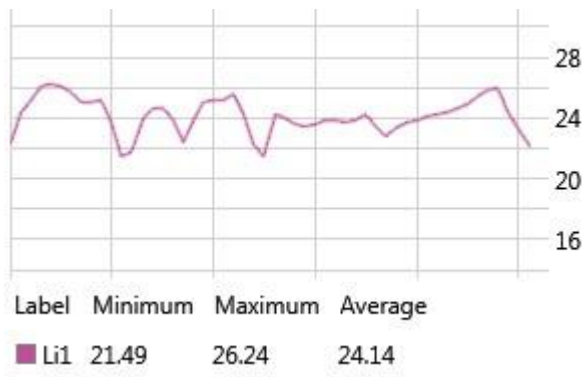
Corrective Action

Date

Repaired by:



IR_6949.jpg | 13/08/2018 | 10:58 AM



| | |
|----------------------------|------------------------|
| File Name | IR_6949.jpg |
| Image Date&Time | 13/08/2018 10:58:30 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 26.2 °C |
| Li1 Minimum | 21.5 °C |

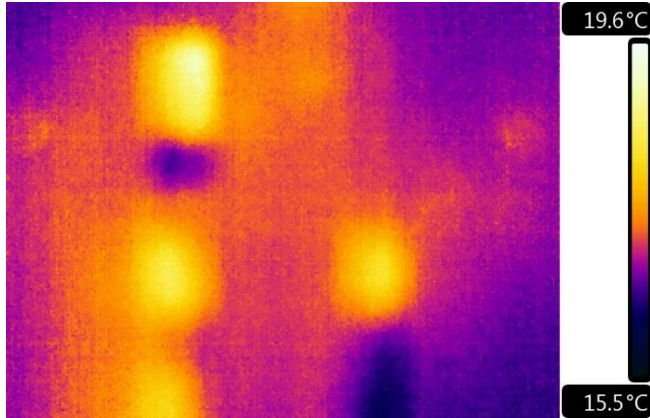
| | |
|-------------------|--|
| Company | TERWNADARY PTY LTD |
| Barcode | |
| Location | SITE 1, WESTERN SIDE, MIDDLE OF THE SHED |
| Object ID | K1 CONTACTOR |
| Fault Description | BUZZING CONTACTOR |
| Fault Rating | LOW |
| Remedy | CHECK FOR LOOSE CONNECTIONS |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

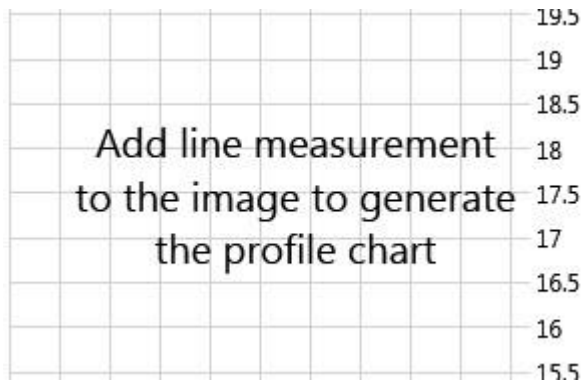
Corrective Action

Date

Repaired by:



IR_6951.jpg | 13/08/2018 | 11:06 AM



| | |
|----------------------------|------------------------|
| File Name | IR_6951.jpg |
| Image Date&Time | 13/08/2018 11:06:38 AM |
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| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |

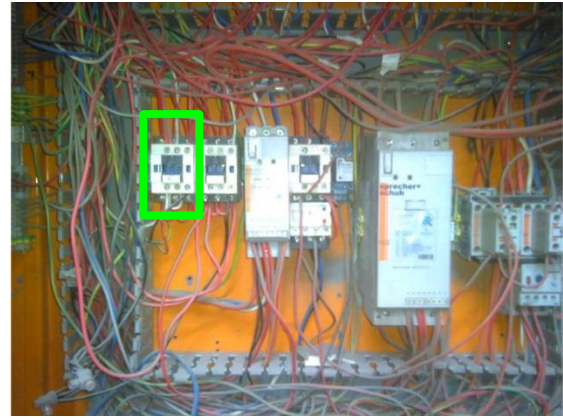
| | |
|-------------------|--|
| Company | TERWANDARY PTY LTD |
| Barcode | |
| Location | SITE 1, EASTERN SIDE, MIDDLE OF THE SHED |
| Object ID | DB WY2 |
| Fault Description | MISSING POLE FILLERS |
| Fault Rating | LOW |
| Remedy | REPLACE POLE FILLERS |
| Thermographer | BEN MARTIN |

| | | | |
|------------|-----------------|-------------|----------------|
| LOW | MODERATE | HIGH | EXTREME |
|------------|-----------------|-------------|----------------|

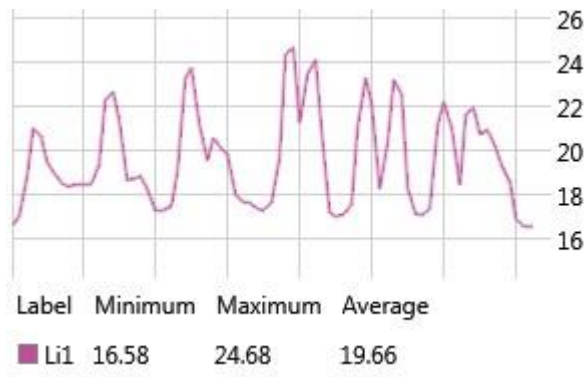
Corrective Action

Date

Repaired by:



IR_6953.jpg | 16/08/2018 | 7:38 AM



| | |
|----------------------------|-----------------------|
| File Name | IR_6953.jpg |
| Image Date&Time | 16/08/2018 7:38:02 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Li1 Maximum | 24.7 °C |
| Li1 Minimum | 16.6 °C |

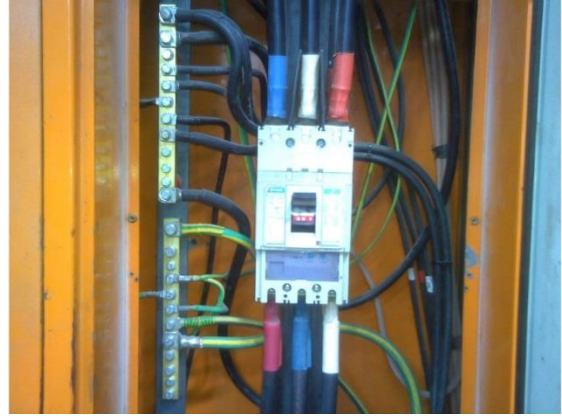
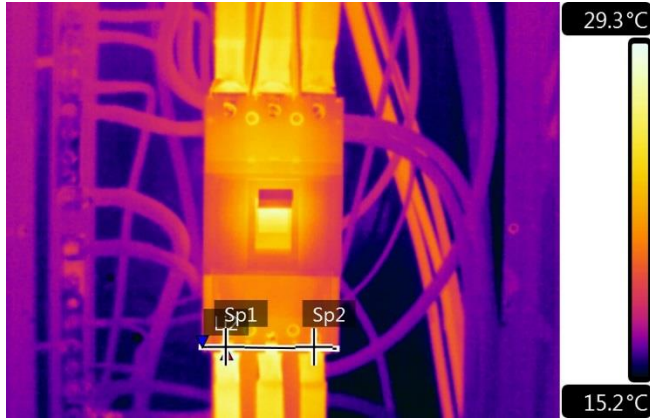
| | |
|-------------------|--------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | |
| Location | SITE 1, MAIN SWITCHBOARD |
| Object ID | K1 CONTACTOR |
| Fault Description | BUZZING CONTACTOR |
| Fault Rating | LOW |
| Remedy | CHECK CONNECTIONS ON CONTACTOR |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

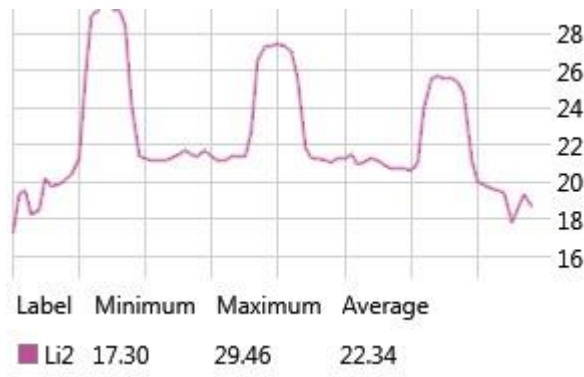
Corrective Action

Date

Repaired by:



IR_6955.jpg | 13/08/2018 | 11:16 AM



| | |
|----------------------------|------------------------|
| File Name | IR_6955.jpg |
| Image Date&Time | 13/08/2018 11:16:54 AM |
| Image Camera Model | FLIR T440 (incl Wi- |
| Image Camera Lens | FOL18 |
| Image Camera Serial Number | 62101292 |
| Object Emissivity | 1.00 |
| Sp1 | 29.5 °C |
| Sp2 | 25.8 °C |
| Li2 Maximum | 29.5 °C |
| Li2 Minimum | 17.3 °C |

| | |
|-------------------|----------------------------------|
| Company | TERWANDARY PTY LTD |
| Barcode | |
| Location | SITE 1, MAIN SWITCHBOARD |
| Object ID | MAIN SWITCH |
| Fault Description | NO FAULT FOUND |
| Fault Rating | NONE |
| Remedy | MAINTAIN REGULAR THERMAL IMAGING |
| Thermographer | BEN MARTIN |

| | | | |
|-----|----------|------|---------|
| LOW | MODERATE | HIGH | EXTREME |
|-----|----------|------|---------|

Corrective Action

Date

Repaired by: