



CUSTOMER INFORMATION

Report: #215
February 19, 2019
John Smith
Widget Manufacturing
123 Main St.
Chicago, IL.

REPORT PREPARED BY:

Michael Fitzpatrick
Thermal Recon
Crestwood, KY. 40014
[Email: mfitz@thermalrecon.com](mailto:mfitz@thermalrecon.com)
Cell: (502)693-7626

ABOUT THE INSPECTION REPORT

Thermal Recon recently conducted an infrared inspection on the electrical distribution system at your facility. The purpose of this inspection was to identify potential problems within that system. Infrared technology is a nondestructive way to identify potential problems within the electrical system.

The following report will be broken into two sections. The first section will be an inventory of equipment by location. Each piece of equipment will have the location, name and inspection status identified. If an issue is found, it will be detailed in an error sheet. The error sheet will include an infrared image and a digital image. It will also include equipment readings, ratings, target points, and temperature differentials. A problem priority will be assigned and recommendations will be suggested to help you prioritize the issues. These are recommendations only, and do require further investigation to determine the actual repair procedure.

DISCLAIMER

Thermal Recon does not claim to list all hazards that exist during the inspection. Some equipment may not be under load, and thus, an accurate reading is not possible. Every effort will be made to inspect all equipment. Equipment that is clearly off, will be identified as such.

INDEMNIFICATION

Thermal Recon assumes no liability to the company for which this service is provided. Any loss or damages suffered or occurring in connection with the service provided is the sole responsibility of the client.

PRIORITY CHART

| PRIORITY RATING CHART | | |
|-----------------------|-----------------|---------------------------|
| RATING | TEMP. RANGE (F) | RECOMMENDED ACTION |
| 1 | 1 F - 20 F | INVESTIGATE ISSUE |
| 2 | 21 F - 40 F | SCHEDULE REPAIR |
| 3 | 41 F - 60 F | PRIORITIZE REPAIR |
| 4 | ABOVE 60 F | IMMEDIATE ACTION REQUIRED |

Ratings are based on the industry standards.



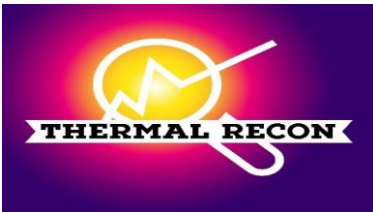
Widget Manufacturing

Report: #215

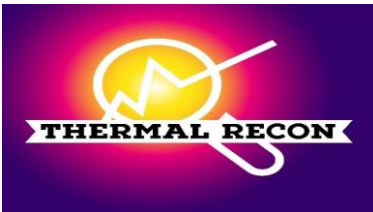
February 19, 2019

ERROR SUMMARY

| LOCATION | EQUIPMENT NAME | EQUIPMENT TYPE | STATUS | ERROR # |
|-----------------------|-----------------|--------------------|--------|---------|
| ROOF | RTU 1 | CONTROL PANEL | TESTED | 1 |
| POWERHOUSE | BOILER 2 | CONTROL PANEL | TESTED | 2 |
| NORTH ELECTRICAL ROOM | 1CHA | BRANCH PANEL | TESTED | 3 |
| POWERHOUSE | MCC 1 SECTION 1 | MCC | TESTED | 4 |
| SOUTH ELECTRICAL ROOM | TX5 | TRANSFORMER | TESTED | 5 |
| WEST ELECTRICAL ROOM | H6 | DISTRIBUTION PANEL | TESTED | 6 |



| LOCATION | EQUIPMENT NAME | EQUIPMENT TYPE | STATUS | ERROR |
|------------|-----------------|--------------------|-----------|-------|
| POWERHOUSE | MSB SECTION 1 | SWITCHGEAR | TESTED | |
| POWERHOUSE | MSB SECTION 2 | SWITCHGEAR | TESTED | |
| POWERHOUSE | MSB SECTION 3 | SWITCHGEAR | TESTED | |
| POWERHOUSE | MSB SECTION 4 | SWITCHGEAR | TESTED | |
| POWERHOUSE | EXHAUST FAN 1-1 | STARTER-DISCONNECT | TESTED | |
| POWERHOUSE | QH1 | BRANCH PANEL | TESTED | |
| POWERHOUSE | QL1 | BRANCH PANEL | TESTED | |
| POWERHOUSE | NL1 | BRANCH PANEL | TESTED | |
| POWERHOUSE | NH1 | BRANCH PANEL | TESTED | |
| POWERHOUSE | BOILER 1 | CONTROL PANEL | TESTED | |
| POWERHOUSE | BOILER 1 | DISCONNECT | TESTED | |
| POWERHOUSE | BOILER 2 | CONTROL PANEL | TESTED | 2 |
| POWERHOUSE | BOILER 2 | DISCONNECT | NO ACCESS | |
| POWERHOUSE | N | ATS | TESTED | |
| POWERHOUSE | LS | ATS | TESTED | |
| POWERHOUSE | EC | ATS | TESTED | |
| POWERHOUSE | PUMP 1 | DISCONNECT | TESTED | |
| POWERHOUSE | PUMP 2 | DISCONNECT | NO LOAD | |
| POWERHOUSE | PUMP 3 | DISCONNECT | TESTED | |
| POWERHOUSE | SDP | DISTRIBUTION PANEL | TESTED | |
| POWERHOUSE | NDP | DISTRIBUTION PANEL | TESTED | |
| POWERHOUSE | QDP | DISTRIBUTION PANEL | TESTED | |
| POWERHOUSE | TX2 | TRANSFORMER | TESTED | |
| POWERHOUSE | TX3 | TRANSFORMER | TESTED | |
| POWERHOUSE | GDP | DISTRIBUTION PANEL | TESTED | |
| POWERHOUSE | 1CPHA | BRANCH PANEL | TESTED | |
| POWERHOUSE | 1CPLA | BRANCH PANEL | TESTED | |
| POWERHOUSE | ECLB-1 | BRANCH PANEL | TESTED | |
| POWERHOUSE | ECLB-2 | BRANCH PANEL | TESTED | |
| POWERHOUSE | CHILLER 1 | CONTROL PANEL | TESTED | |
| POWERHOUSE | CHILLER 2 | CONTROL PANEL | TESTED | |
| POWERHOUSE | CWP 1 | DISCONNECT | TESTED | |
| POWERHOUSE | CWP 2 | DISCONNECT | TESTED | |
| POWERHOUSE | HWP 1 | DISCONNECT | TESTED | |
| POWERHOUSE | HWP 2 | DISCONNECT | TESTED | |
| POWERHOUSE | MCC 1 SECTION 1 | MCC | TESTED | 4 |
| POWERHOUSE | MCC 1 SECTION 2 | MCC | TESTED | |



| LOCATION | EQUIPMENT NAME | EQUIPMENT TYPE | STATUS | ERROR |
|-----------------------|-----------------|--------------------|---------|-------|
| POWERHOUSE | MCC 1 SECTION 3 | MCC | TESTED | |
| POWERHOUSE | MCC 1 SECTION 4 | MCC | TESTED | |
| POWERHOUSE | MCC 1 SECTION 5 | MCC | TESTED | |
| POWERHOUSE | MCC 1 SECTION 6 | MCC | TESTED | |
| COOLING TOWER AREA | CT 1 FAN | DISCONNECT | TESTED | |
| COOLING TOWER AREA | CT1 HEATER | DISCONNECT | TESTED | |
| COOLING TOWER AREA | CT 2 FAN | DISCONNECT | TESTED | |
| COOLING TOWER AREA | CT 2 HEATER | DISCONNECT | TESTED | |
| NORTH ELECTRICAL ROOM | 1NHE | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | 1NLE | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | 1HEQC | DISTRIBUTION PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | TX1 | TRANSFORMER | TESTED | |
| NORTH ELECTRICAL ROOM | TX1 | DISCONNECT | TESTED | |
| NORTH ELECTRICAL ROOM | EXHAUST FAN 1-3 | STARTER-DISCONNECT | TESTED | |
| NORTH ELECTRICAL ROOM | 1CLA | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | 1CHA | BRANCH PANEL | TESTED | 3 |
| NORTH ELECTRICAL ROOM | ECT | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | EDP | DISTRIBUTION PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | GLSA | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | GSL | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | GSH | BRANCH PANEL | TESTED | |
| NORTH ELECTRICAL ROOM | TX4 | TRANSFORMER | TESTED | |
| NORTH ELECTRICAL ROOM | TX4 | DISCONNECT | TESTED | |
| SOUTH ELECTRICAL ROOM | CRP | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | CDP | DISTRIBUTION PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | CL | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | EL | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | 1NLC | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | SHP 1 | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | SHP 2 | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | TX5 | TRANSFORMER | TESTED | 5 |
| SOUTH ELECTRICAL ROOM | TX5 | DISCONNECT | TESTED | |
| SOUTH ELECTRICAL ROOM | EXHAUST FAN 1-4 | STARTER-DISCONNECT | NO LOAD | |
| SOUTH ELECTRICAL ROOM | PP1 | BRANCH PANEL | TESTED | |
| SOUTH ELECTRICAL ROOM | EP1 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | LL1 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | HL1 | BRANCH PANEL | TESTED | |



| LOCATION | EQUIPMENT NAME | EQUIPMENT TYPE | STATUS | ERROR |
|----------------------|-----------------|--------------------|---------|-------|
| EAST ELECTRICAL ROOM | HC1 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | HN1 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | FF | DISTRIBUTION PANEL | TESTED | |
| EAST ELECTRICAL ROOM | U | DISTRIBUTION PANEL | TESTED | |
| EAST ELECTRICAL ROOM | CHR | DISTRIBUTION PANEL | TESTED | |
| EAST ELECTRICAL ROOM | EXHAUST FAN 1-5 | STARTER-DISCONNECT | TESTED | |
| EAST ELECTRICAL ROOM | Y2 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | X3 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | E2 | BRANCH PANEL | TESTED | |
| EAST ELECTRICAL ROOM | TX6 | TRANSFORMER | TESTED | |
| EAST ELECTRICAL ROOM | TX6 | DISCONNECT | TESTED | |
| WEST ELECTRICAL ROOM | H8 | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | L6A | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | L6B | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | H5 | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | L3 | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | L2 | BRANCH PANEL | TESTED | |
| WEST ELECTRICAL ROOM | H6 | DISTRIBUTION PANEL | TESTED | 6 |
| WEST ELECTRICAL ROOM | L6 | DISTRIBUTION PANEL | TESTED | |
| WEST ELECTRICAL ROOM | TX7 | TRANSFORMER | TESTED | |
| WEST ELECTRICAL ROOM | TX7 | DISCONNECT | TESTED | |
| WEST ELECTRICAL ROOM | EXHAUST FAN 1-7 | STARTER-DISCONNECT | TESTED | |
| ROOF | RTU 1 | DISCONNECT | TESTED | |
| ROOF | RTU 1 | CONTROL PANEL | TESTED | 1 |
| ROOF | RTU 2 | DISCONNECT | NO LOAD | |
| ROOF | RTU 2 | CONTROL PANEL | NO LOAD | |
| ROOF | RTU 3 | DISCONNECT | TESTED | |
| ROOF | RTU 3 | CONTROL PANEL | TESTED | |
| ROOF | RTU 4 | DISCONNECT | TESTED | |
| ROOF | RTU 4 | CONTROL PANEL | TESTED | |
| ROOF | RTU 5 | DISCONNECT | TESTED | |
| ROOF | RTU 5 | CONTROL PANEL | TESTED | |

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 1 |
|----------------------|--------------|-------------------|---------|

EQUIPMENT INFORMATION

| | | | |
|-----------------|---------------------|-----------------|---------|
| LOCATION: | Roof | RATED VOLTAGE: | 277/480 |
| EQUIPMENT TYPE: | Control Panel | RATED AMPS: | 30 |
| EQUIPMENT NAME: | RTU 1 - T 742A HTR1 | PRIORITY LEVEL: | 3 |

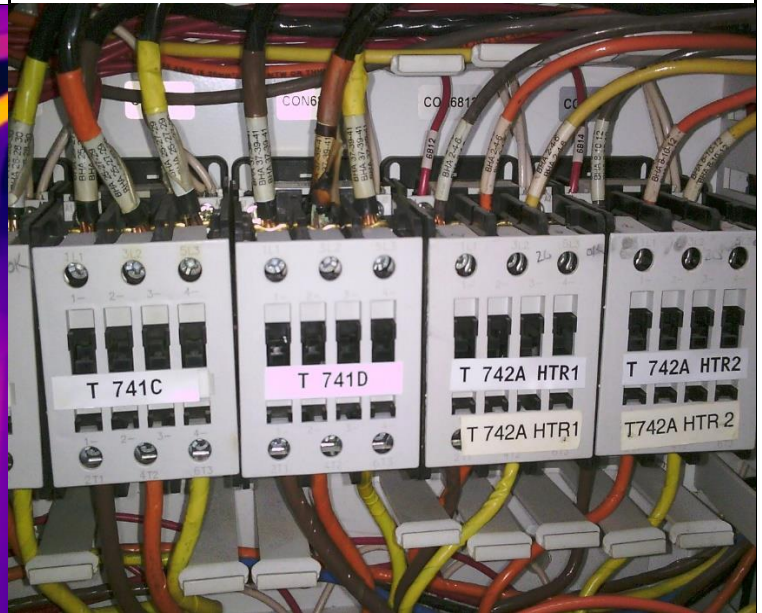
EQUIPMENT DATA

| | | | |
|------------------|---------|---------------------------|-------|
| TARGET POINT: | C Phase | TARGET TEMP: | 163.1 |
| REFERENCE POINT: | A Phase | REFERENCE TEMP: | 119.4 |
| TARGET AMPS: | 20 | TEMPERATURE DIFFERENTIAL: | 43.7 |
| LOAD (AMPS) %: | 66.7% | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

Visual heat damage on B phase line side conductor on component T 741D. Check all connections and repair if necessary.

RECOMMENDATIONS:

Check C phase line side lug and conductor on component T 742A HTR1.

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 2 |
|----------------------|--------------|-------------------|---------|

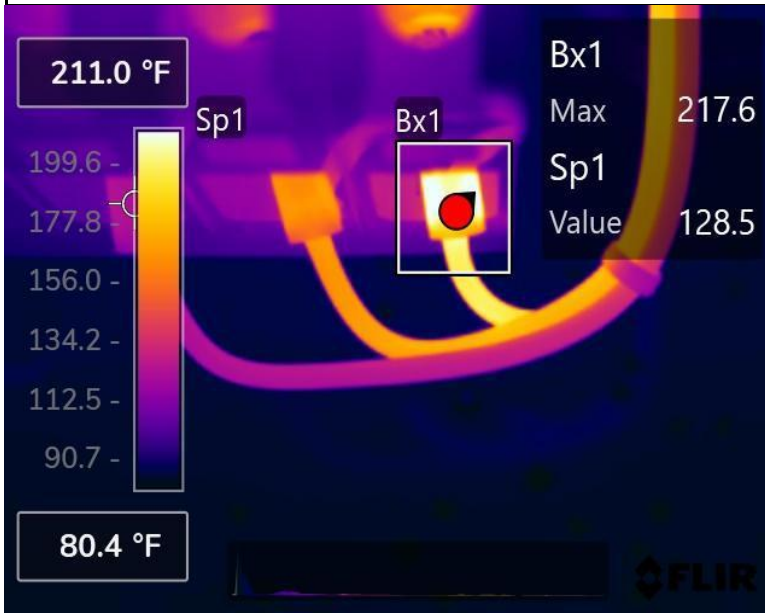
EQUIPMENT INFORMATION

| | | | |
|-----------------|---------------|-----------------|-----|
| LOCATION: | Powerhouse | RATED VOLTAGE: | 277 |
| EQUIPMENT TYPE: | Control Panel | RATED AMPS: | 30 |
| EQUIPMENT NAME: | Boiler 2 | PRIORITY LEVEL: | 4 |

EQUIPMENT DATA

| | | | |
|------------------|------------------------------|---------------------------|-------|
| TARGET POINT: | C phase load side connection | TARGET TEMP: | 217.6 |
| REFERENCE POINT: | A phase load side connection | REFERENCE TEMP: | 128.5 |
| TARGET AMPS: | 22 | TEMPERATURE DIFFERENTIAL: | 89.1 |
| LOAD (AMPS) %: | 73.3% | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

Excessive heat differential between the A and C phase connections.

RECOMMENDATIONS:

Check C phase load side connection.

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 3 |
|----------------------|--------------|-------------------|---------|

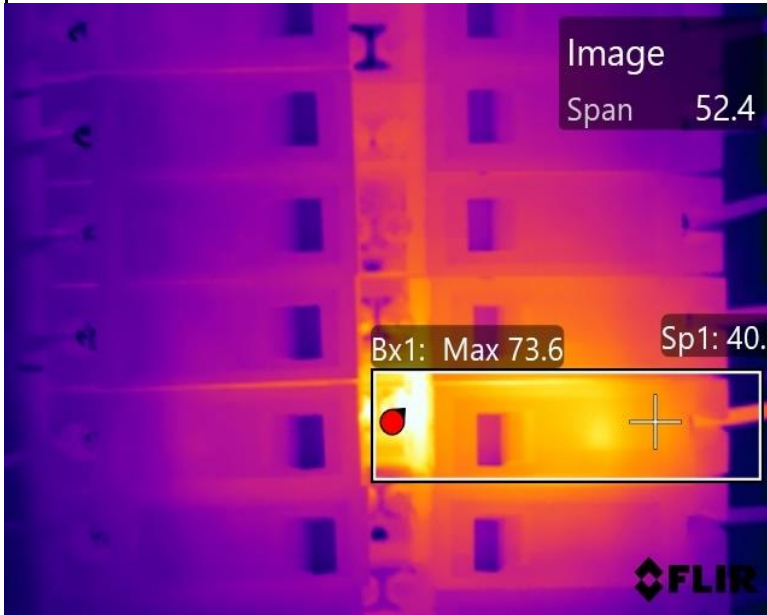
EQUIPMENT INFORMATION

| | | | |
|-----------------|-----------------------|-----------------|-----|
| LOCATION: | North electrical room | RATED VOLTAGE: | 120 |
| EQUIPMENT TYPE: | Branch panel | RATED AMPS: | 20 |
| EQUIPMENT NAME: | 1CHA | PRIORITY LEVEL: | |

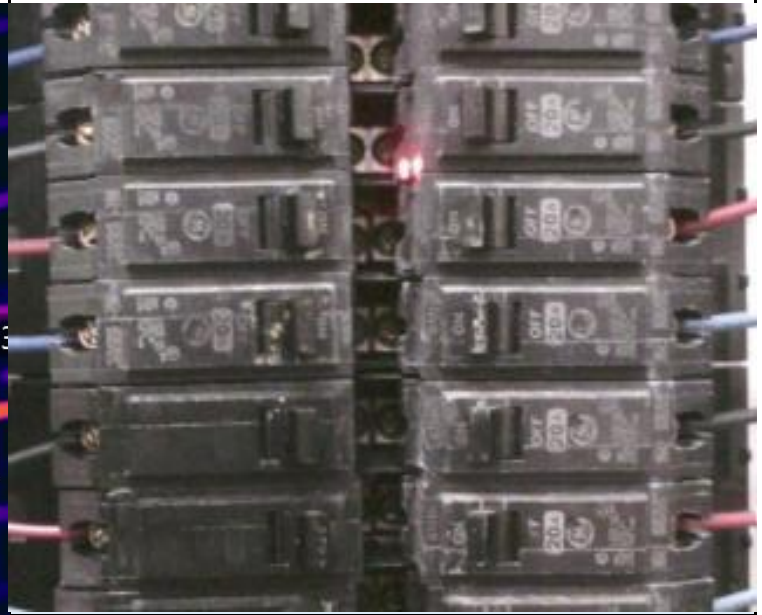
EQUIPMENT DATA

| | | | |
|------------------|----------------------|---------------------------|------|
| TARGET POINT: | Breaker 14 buss side | TARGET TEMP: | 73.6 |
| REFERENCE POINT: | Breaker 14 lug side | REFERENCE TEMP: | 40.3 |
| TARGET AMPS: | 13.2 | TEMPERATURE DIFFERENTIAL: | 33.3 |
| LOAD (AMPS) %: | 66.0% | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

RECOMMENDATIONS:

Possible buss connection problem. Check buss side connection on breaker 14.

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 4 |
|----------------------|--------------|-------------------|---------|

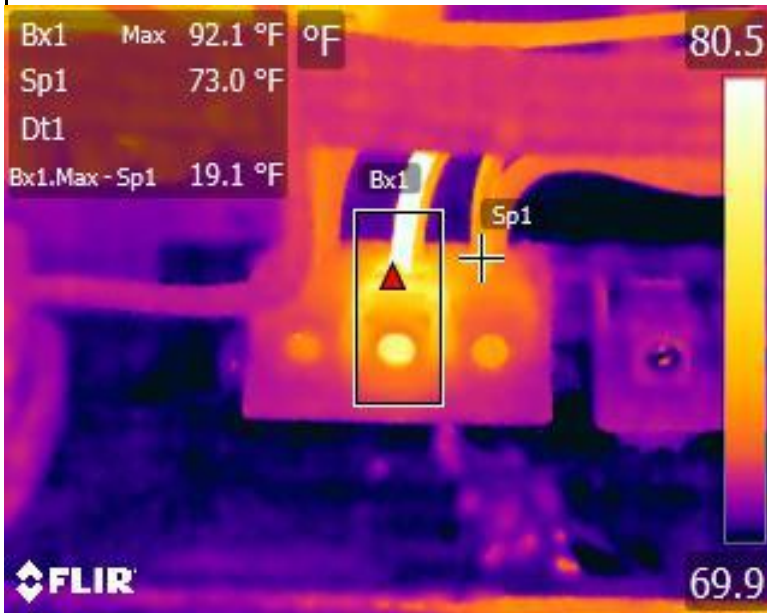
EQUIPMENT INFORMATION

| | | | |
|-----------------|--------------------------------|-----------------|-----|
| LOCATION: | Powerhouse | RATED VOLTAGE: | 120 |
| EQUIPMENT TYPE: | MCC | RATED AMPS: | 10 |
| EQUIPMENT NAME: | MCC Section 1, overhead pump A | PRIORITY LEVEL: | |

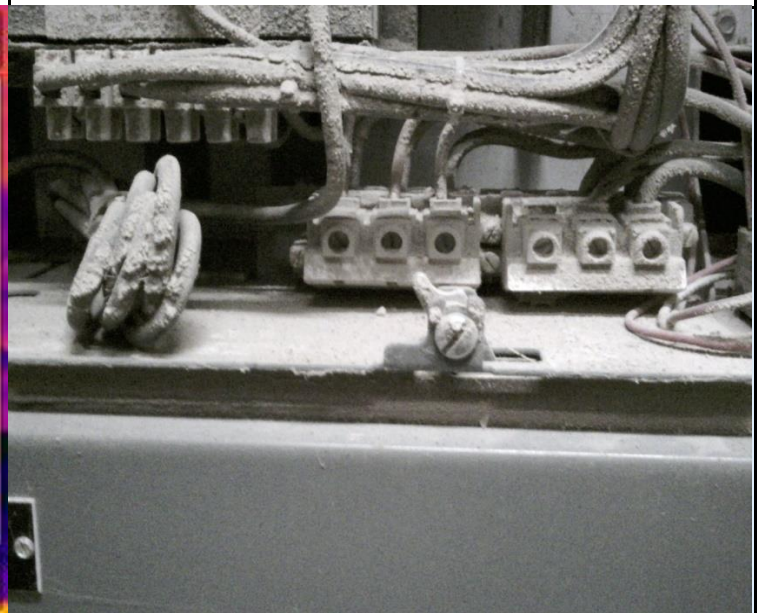
EQUIPMENT DATA

| | | | |
|------------------|-------------|---------------------------|------|
| TARGET POINT: | B phase lug | TARGET TEMP: | 92.1 |
| REFERENCE POINT: | C phase lug | REFERENCE TEMP: | 73 |
| TARGET AMPS: | 3.8 | TEMPERATURE DIFFERENTIAL: | 19.1 |
| LOAD (AMPS) %: | 38.0% | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

RECOMMENDATIONS:

B phase lug on terminal strip showing a possible problem. Check/repair lug connection.

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 5 |
|----------------------|--------------|-------------------|---------|

EQUIPMENT INFORMATION

| | | | |
|-----------------|-----------------------|-----------------|-----|
| LOCATION: | South electrical room | RATED VOLTAGE: | 480 |
| EQUIPMENT TYPE: | Transformer | RATED AMPS: | NA |
| EQUIPMENT NAME: | TX5 | PRIORITY LEVEL: | |

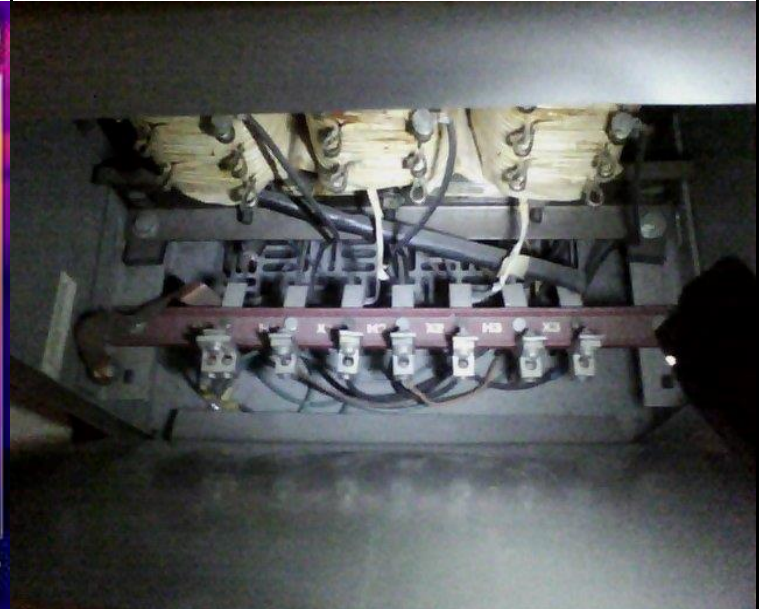
EQUIPMENT DATA

| | | | |
|------------------|----|---------------------------|-------|
| TARGET POINT: | X1 | TARGET TEMP: | 173.5 |
| REFERENCE POINT: | X2 | REFERENCE TEMP: | 88.1 |
| TARGET AMPS: | NA | TEMPERATURE DIFFERENTIAL: | 85.4 |
| LOAD (AMPS) %: | | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

RECOMMENDATIONS:

Excessive Heat differential between X1 and X2 lug connections. Check/repair X1 lug connection.

| | | | |
|----------------------|--------------|-------------------|---------|
| Widget Manufacturing | Report: #215 | February 19, 2019 | ERROR 6 |
|----------------------|--------------|-------------------|---------|

EQUIPMENT INFORMATION

| | | | |
|-----------------|----------------------|-----------------|---------|
| LOCATION: | West electrical room | RATED VOLTAGE: | 480/277 |
| EQUIPMENT TYPE: | Distribution panel | RATED AMPS: | 100 |
| EQUIPMENT NAME: | H6 (Breaker 5) | PRIORITY LEVEL: | |

EQUIPMENT DATA

| | | | |
|------------------|------------------------|---------------------------|-------|
| TARGET POINT: | C phase lug connection | TARGET TEMP: | 111.5 |
| REFERENCE POINT: | A phase lug connection | REFERENCE TEMP: | 83.8 |
| TARGET AMPS: | 71 | TEMPERATURE DIFFERENTIAL: | 27.7 |
| LOAD (AMPS) %: | 71.0% | | |

INFRARED IMAGE



DIGITAL IMAGE



VISUAL NOTES:

Excessive heat on C phase lug to Breaker 5 on distribution panel H6.

RECOMMENDATIONS:

Check C phase lug connection.