

SA-CE-929-2001-1 Thermography Inspection Form Rev 4

Date _____ Time _____ Inspected By _____

Manhole/Vault/Equipment# _____ Feeder _____

◆ [] No anomaly found [] Thermal Anomaly Found Outside Air temp _____ °F OR °C (circle)

Description of thermographic anomaly (cable, joint, termination, bond/ground connection, etc.):

Hot Spot Temperature _____ °F OR °C (circle)

Reference Temperature _____ °F OR °C (circle)

Note: Hot Spot and Reference Temperature measurements shall be taken from the same phase. Comparing adjacent phase temperatures does not constitute a hot spot condition.

Temperature differential or ΔT _____ °F OR _____ °C (ΔT = Hot Spot temp – Reference temp)

Duct or equipment positions that the anomaly is located between (as appropriate):

Duct Position and Direction _____ (for example 11N, 34W, 24SE, etc.)

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Equipment # _____ Disconnect # _____

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Feeder Load _____ Amperes (Obtain from Designated Authority at the time the temperature differential (ΔT) was recorded)

Abnormal Condition Tags placed:

- On cable adjacent to the identified anomaly (circle one) Yes No
- Top of the manhole ladder or entrance (circle one) Yes No

→ Other Comments: _____

Signatures:

Crew leader: _____ Date: _____

Supervisor: _____ Date: _____

Entered By: _____ Date: _____

Asset Suite:

Work Request Number: _____ Priority _____

Scanned inspection forms uploaded: (circle one) Yes No

Thermal Images uploaded: (circle one) Yes No

Digital Photographic Images uploaded: (circle one) Yes No

Skip, if no anomaly found

References

Temperature conversion

To convert °F to °C:

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

To convert °C to °F:

$$^{\circ}\text{F} = \left(^{\circ}\text{C} \times \frac{9}{5}\right) + 32$$

Temperature differential (ΔT) conversion

To convert ΔT from °F to °C:

$$\Delta T_{^{\circ}\text{C}} = \Delta T_{^{\circ}\text{F}} \times 0.556$$

To convert ΔT from °C to °F:

$$\Delta T_{^{\circ}\text{F}} = \Delta T_{^{\circ}\text{C}} \times 1.8$$

Corrective actions for rise in localized temperature differentials

ΔT		Actions
°C	°F	
1–3	1–5	<ol style="list-style-type: none"> 1. PLACE suspension of reclose 2. PLACE Abnormal Condition tags at the top of the enclosed space at each entrance. 3. MONITOR every 1-2 hours to account for changes in loading 4. Planner / FIN Planner to CREATE WR/WO and ASSIGN as Pri-40
4–14	6–25	<ol style="list-style-type: none"> 1. EXIT workspace 2. PLACE an Abnormal Condition tag at the entrance(s) to the enclosed space. 3. DE-ENERGIZE before re-entry 4. Designated Authority to CREATE WR/WO and ASSIGN as Pri-30
≥ 15	≥ 26	<ol style="list-style-type: none"> 1. EXIT workspace 2. PLACE an Abnormal Condition tag at the entrance(s) to the enclosed space. 3. DE-ENERGIZE before re-entry 4. Designated Authority to CREATE WR/WO and ASSIGN as Pri-20
Overall cable surface temperature $> 75^{\circ}\text{C}$ (167°F)		<ol style="list-style-type: none"> 1. EXIT workspace 2. PLACE an Abnormal Condition tag at the entrance(s) to the enclosed space. 3. DE-ENERGIZE before re-entry 4. Designated Authority to CREATE WR/WO and ASSIGN as Pri-10

Emissivity

Per the Electrical Test Equipment & Tools training, it is recommended to set IR camera to emissivity of 1.0. Emissivity can be adjusted depending on how much light reflects off the material being captured. Most underground equipment/cable being assessed reflects very little light, so emissivity should be set to 1.0 in most cases. Setting emissivity to 1.0 also eliminates the need to adjust background temperature

If needed, users with Level II or higher Infrared Thermography Certification can use these other adjustment settings:

- 0.95 for Black electrical tape & cable jackets
- 0.93 for Rubber cable accessories
- 0.63 for Lead, oxidized dull, weathered appearance
- 0.08 for lead, shiny, new