

A Proactive Approach to Keep Equipment Cool this Summer

EXPANSE
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Excessive heat can cause equipment to operate outside its designed temperature limits.

Prolonged exposure to excessive heat can:

- Reduce the operating life of electronic hardware
- Require derating of power and equipment
- Change circuit protection performance
- Contribute to overload conditions

Expanse offers comprehensive solutions to keep your equipment operating at optimum conditions.



MONITORING & ALERTS

Expanse's solutions include AI-based analytics with predictive maintenance, providing new avenues for early event detection that enable facilities to take corrective actions.

A typical system is comprised of:

- Power monitoring
- Predictive analytics
- Operational information
- Event detection and notifications
- Condition monitoring
- Site dispatch
- Equipment lifecycle monitoring



PREVENTATIVE MAINTENANCE

Expanse offers a detailed scope and interval for maintenance and the testing of electrical equipment following the guidelines found in ANSI Maintenance Standards, NFPA 70B, and NFPA 70E.

Typical equipment requiring testing and maintenance:

- Medium voltage motor controls
- Battery chargers
- Low voltage motor controls
- UPS systems
- Variable frequency drives
- Medium voltage transformers
- Switchgear



THERMAL MANAGEMENT

The effects of solar radiation on control panels can cause the internal temperature to rise dramatically. Expanse utilizes thermal management systems to maintain optimal environmental conditions inside control enclosures.

Controlling the temperature can:

- Eliminate condensation inside enclosure
- Help account for solar heat gain
- Eliminate overheating of devices
- Decrease solar heat gain



AIR FLOW OPTIMIZATION

Without proper air flow the enclosure can turn into a hot box, trapping the heat. Clear and debris-free air passages in cooling systems provide efficient exchange of outside air.

Cooling systems maintenance program includes:

- Air filter cleaning or replacement
- Excessive dust, dirt, debris buildup removal
- Condenser coils and fan blades dust accumulation inspection
- Air intake and exhaust routes obstruction removal

SUMMER

PREVENTATIVE MAINTENANCE CHECKLIST



ELECTRICAL EQUIPMENT

- ☐ Review the last electrical inspection report to determine the next test cycle
- ☐ Perform Infrared Scan on switchgear
- ☐ Inspect grounding systems to ensure proper grounding and minimize the risk of electrical shock or equipment damage due to lightning strikes
- ☐ Verify the functionality of backup power systems, such as generators or uninterruptible power supplies (UPS), to ensure they can handle increased power demands during summer heatwaves or potential power outages
- ☐ Ensure that electrical panels have adequate ventilation and are not obstructed by equipment or other objects that could impede airflow and contribute to overheating
- ☐ Check for insulation degradation, particularly in outdoor electrical cables or exposed wiring, and repair or replace as necessary to avoid potential electrical hazards
- ☐ Review and maintain fire safety equipment, such as fire extinguishers or sprinkler systems, to minimize fire risks associated with electrical equipment
- ☐ Inspect and tighten all electrical connections, terminals, and wiring to prevent loose connections or hot spots that can be exacerbated by higher temperatures
- ☐ Verify the condition and effectiveness of surge protection devices to safeguard against power surges, which may occur more frequently during summer storms
- ☐ Clean equipment surfaces and remove any debris, dust, or vegetation that may have accumulated, particularly around cooling vents or air intake areas
- ☐ Check cooling systems, such as fans or air conditioning units, for proper operation and cleanliness; clean or replace air filters as needed
- ☐ Provide training to staff on electrical safety precautions, including heat-related risks, proper lockout/tagout procedures, and emergency response protocols



TRANSFORMERS

- ☐ Check the oil level in the transformer and ensure it is within the recommended range; perform oil analysis to assess its quality, including checking for moisture content and the presence of contaminants
- ☐ Conduct a visual inspection of the transformer, checking for any signs of oil leaks, physical damage, or loose connections; pay particular attention to bushings, terminals, and cooling fins
- ☐ Perform visual inspection on the Lightning Arrestors (LAs) for potential failures
- ☐ Review the last transformer test reports and identify if it is due for a new test
- ☐ Use temperature sensors or thermal imaging to monitor the operating temperature of the transformer; ensure temperatures are within acceptable limits and investigate any abnormal hotspots
- ☐ Cooling system maintenance: Inspect and clean cooling fans, radiators, or cooling tubes to ensure efficient heat dissipation; clear any obstructions such as dirt or debris that could impede airflow
- ☐ Bushing inspection: Inspect bushings for signs of cracking, leakage, or tracking; clean and tighten the connections to ensure reliable performance and minimize the risk of flashovers
- ☐ Evaluate the environmental conditions around the transformer, such as excessive dust, moisture, or exposure to direct sunlight; take appropriate measures to mitigate these factors



ARC FLASH

- ☐ Compare ARC Flash sticker dates against any system changes or updates
- ☐ Complete an ARC Flash study with Expanse to review for potential gaps
- ☐ Ensure that workers are equipped with appropriate personal protective equipment (PPE) designed for ARC Flash protection, including flame-resistant clothing, face shields, ARC Flash suits, gloves, and safety glasses; consider lightweight and breathable options for summer conditions
- ☐ Review and update ARC Flash labels on electrical equipment, ensuring they are accurate and visible
- ☐ Monitor and manage electrical loads during peak demand periods to reduce stress on electrical systems, which can help minimize the risk of ARC Flash incidents caused by overloaded circuits or equipment



VFDS

- ☐ Inspect illuminated devices, push buttons, covers, door latches, and isolation switches
- ☐ Inspect and clean air filters and cooling fans
- ☐ Remove dust, dirt, or debris with a dry and clean rag (do not use cleaning solutions)
- ☐ Conduct motor autotune function (if applicable)
- ☐ Re-torque line cabling, load cabling, and control cabling
- ☐ Review alarm and faults history - clear old alarms and faults
- ☐ Refer to the VFDs OEM provided Preventative Maintenance Guidelines



AUTOMATION

- ☐ Cooling system inspection: Check and clean cooling fans, filters, and heat sinks
- ☐ Clean equipment surfaces, control panels, and ventilation areas to prevent overheating
- ☐ Inspect for any signs of damage, loose connections, overheating
- ☐ Verify functionality of backup power such as UPS systems
- ☐ Check for any software updates to enhance performance and security
- ☐ Review fire suppression systems and protocols
- ☐ Perform safety inspections to ensure safe operation
- ☐ Evaluate the inventory of spare parts
- ☐ Evaluate or apply protective films or coatings on operator interface panels exposed to sunlight
- ☐ Evaluate the protection of outdoor automation equipment against direct sunlight, rain, and extreme temperatures
- ☐ Implement measures to prevent pests such as rodents or insects from causing equipment damage