



Critical Equipment Diagnostics

See the Heat Before It Burns – Strike Before It Bites

Independent Diagnostics for High-Risk Electrical Assets

RATTLIR provides engineering-focused diagnostic services designed to improve visibility into the condition of critical electrical assets – especially those that remain energized and are difficult to assess through traditional inspection and compliance programs.

Core Capabilities

- Infrared thermography (aerial and ground-based)
- Partial discharge and acoustic diagnostics
- Visual condition assessments of energized equipment
- Independent, non-repair evaluations
- Engineering-grade reporting to support maintenance planning and risk prioritization

Where RATTLIR Fits

RATTLIR is designed to complement NERC compliance by providing insight into asset health *between testing intervals* – helping operations, maintenance, and engineering teams identify early indicators before they become outages or safety events.

Supporting

- Power generation facilities
- Switchyards and substations
- Transmission interfaces and balance of plant assets

Particularly where early indicators, energized inspections, and independent diagnostics matter.

Let's Talk

Ask about focused diagnostic pilots and how early-stage visibility can reduce surprises in critical assets.

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Common High-Voltage Asset Failures

Early Indicators That Often Develop *Between* Compliance Intervals

Representative failure mechanisms observed in power generation and transmission assets.

Many of these failure mechanisms remain compliant, develop gradually, and are difficult to identify without focused diagnostic visibility.

Asset / Component	Common Failure Mechanism	Early Symptoms Observed	Why It's Often Missed
Conductors & terminations (jumpers, lugs, dead-ends)	Increased resistance from strand fatigue, oxidation, or poor compression	Uneven or localized heating under load; phase imbalance	Appears visually intact; heating only develops under energized loading
Disconnect blades & jaw contacts	Loss of contact pressure or surface degradation	Phase-specific heating at blade-to-jaw interfaces	Equipment operates normally; heating appears only during load transfer
Bus duct & generator leads	Joint resistance and mechanical looseness	Localized heating at joints or interface points	Elevated or enclosed systems with limited routine inspection access
Corona rings & electric-field grading hardware	Improper electric-field distribution and localized stress	Audible corona; localized erosion; heating near hardware interfaces	Hardware appears intact; orientation and geometry are rarely questioned
Polymer insulators	Corona cutting and sheath erosion from concentrated electric fields	Localized surface damage; discoloration; progressive erosion near energized end	Degradation develops gradually and may not immediately affect strength
Station insulators (ceramic / glass)	Internal cracking, moisture ingress, or surface contamination	Subtle partial discharge; localized heating; tracking under wet conditions	Damage may be internal or weather-dependent; failure can be sudden
Bushings (transformer / breaker)	Insulation degradation and partial discharge	Phase-specific heating or PD near interfaces	Indicators develop internally; escalation can be rapid
Surge arresters	Moisture ingress, seal degradation, or cumulative overvoltage stress	Localized heating; external cracking; leakage changes	Arresters often appear intact; failure may occur during surge events
Grounding & bonding components	Corrosion or high-resistance connections	No visible symptoms prior to fault events	Considered non-energized; often outside routine inspection scope
Structural components (masts, air terminals, supports)	Corrosion or mechanical degradation	Minor corrosion at base; looseness	Rarely inspected; deterioration progresses slowly



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