TRUE NORTH PROGNOSTICS

“NEAR-PERFECT” MONITORING. REAL EARLY WARNING.

A fundamentally smarter way to manage transformer risk

- Lower O&M costs
- Stronger capital discipline
- Improved reliability metrics
- Reduced headline, regulatory, and safety risk

Industry-leading performance:

AI-MSET delivers the lowest false and missed alarm probability ever published: **1 × 10^5 over 10,000 hours** roughly one error every 1.14 years or **0.001%** — compared to **1.0–10.0%** industry norms. This performance is mathematically proven, peer-reviewed, and published in IEEE.

FROM REACTIVE TO PROACTIVE

Weeks or months of advance notice — not minutes or hours

Traditional monitoring alarms only when thresholds are crossed — usually **after damage has already occurred**. That's reactive maintenance which offers no operational advantage

This gives utilities something they've never had before: time to act with confidence

AI-MSET is different

It detects subtle deviations from normal behavior and provides **the earliest possible warning of degradation**, long before thresholds are ever reached

WHAT “NEAR-PERFECT MONITORING” REALLY MEANS

When AI-MSET issues its first **alert**, it indicates one of three possibilities:

- Data anomaly
- Sensor issue
- True Asset degradation

WHAT “NEAR-PERFECT” MONITORING LOOKS LIKE

What happens next is what makes the system powerful.

… An alert occurs,

- If no follow-on alerts occur, the issue was a **data value anomaly**
- If repeated alerts happen on the same sensor they become alarms, it’s a **sensor issue**
  - A **virtual sensor** is substituted for the failed sensor (sensor MTBF is often less than the asset)
  - Operations continue uninterrupted
  - Physical replacement can wait for routine maintenance
- If alarms increase in frequency ***and*** from correlated sensors, it’s clearly an **asset problem**

This distinction is made confidently, and early — without guesswork.

THE RESULT

“Near-perfect” asset monitoring with:

- No false alerts or alarms driving unnecessary action
- No missed alarms hiding real risk
- The earliest possible detection of real asset degradation

This is not just monitoring. It is decision clarity.

THE PROBLEM UTILITIES FACE

HV Distribution Grid Transformer failures are rare — but catastrophic

A single failure can:

- Dominate SAIDI for an entire year
- Force emergency capital spending
- Trigger regulatory, public, and media scrutiny
- In hindsight, most failures are **explainable.** The the real issue is a lack of **confidence** to act early enough.

That gap between detection and decision is where risk lives

WHY THE RISK IS GROWING

- Fleets are aging
- Loading is increasing
- Replacement lead times now stretch into **multiple years**
- Utilities already have data stored in their DAS: on-line DGAs, oil tests, inspections, alarms
- The problem isn't data - **It's confidence**

Traditional systems confirm failure after damage has already occurred, when replacement is often the only option — at the highest possible cost

In the past, utilities could afford to wait. Today, a single wrong decision can lock in years of constrained operation. That risk is growing as conventional transformers give way to DC technologies across the North American grid—making it critical for utilities to de-risk grid-modernization efforts with AI-MSET.

A BETTER WAY FORWARD

The breakthrough is shifting from condition awareness to "**near-perfect" monitoring.** By detecting degradation **weeks or months earlier**, utilities can:

- Plan maintenance instead of reacting to emergencies
- Reduce truck rolls, overtime, and safety risk
- Improve SAIDI and operational stability
- Lower routine O&M and spare inventory
- Shift from forced replacement to planned intervention

This enables calmer, earlier, and defensible decisions

WHAT THIS ENABLES OPERATIONALLY

When failure timing is known with confidence:

- Outages become **scheduled**, not surprises
- Emergency crews are reduced
- Safety incidents, fires^, and explosions decline (headline risk)
- Operators regain control of timing — and reliability improves

"We manage tail risk, not just averages"

^HV Transformer failures have caused the biggest loss-of-life and property-destruction wild-fires in the history of the U.S.

WHAT THIS MEANS FOR THE BUSINESS

Emergency transformer failures are dramatically more expensive than planned replacements — not just in equipment cost, but in:

- Collateral damage
- Restoration complexity
- Lost operational flexibility

Avoiding **one major failure** often pays for predictive capability many times over.

The #1 greatest risk from HV Transformer failures is wild-fires.

This is not incremental efficiency. This is risk avoidance.

INVENTORY & SUPPLY CHAIN IMPACT

Predictive failure timing transforms inventory strategy.

Instead of holding spares “just in case,” utilities can:

- Align procurement with actual failure risk
- Account for long lead times
- Reduce idle capital tied up in inventory
- Use shared or regional spares more intelligently

DESIGNED FOR TRUST & GOVERNANCE

Trusted, Defensible Operational Intelligence

This is decision support, not blind automation — and that distinction matters

Purpose

- Supports engineering judgment — does not replace it
- Probabilistic, confidence-weighted, and explainable
- Designed for Board, Regulatory, Audit, and Insurance scrutiny

What It Does

- Automatically distinguishes **true asset/process issues** from **sensor or DAQ faults**
- Prevents false alarms caused by bad instrumentation
- Generates targeted maintenance and service actions

DESIGNED FOR TRUST & GOVERNANCE

Why It Matters

- Faster, defensible root-cause analysis
- Higher operational trust and governance confidence
- Certified telemetry for forensic, diagnostic, and predictive use

How It's Different

- Multivariate analytics beyond threshold-based monitoring
- Learns normal behavior directly from historical data
- Validates data integrity **before** it becomes history

This is decision support, not blind automation — and that distinction matters

THE STRATEGIC TAKEAWAY

The real shift is governance

Utilities that adopt predictive failure timing:

- Stop managing surprises
- Start managing outcomes
- Capital is deployed later — but with more confidence
- Inventory is reduced based on evidence, not fear

Leading indicators of precursor mechanisms can be proactively identified weeks and sometime months in advance, enabling small anomalies to be fixed during low-demand time windows

EXECUTIVE INSIGHT — ROI

- This is not an operating expense
- It is a disciplined approach to capital risk protection
- Near-zero false and missed alarms with the earliest annunciation of a problem enable earlier, defensible decisions — and better outcomes