Transformer CBM Pilot Measurement Scorecard

A practical worksheet for turning GridAPM calculator results into a 30-day, human-reviewed transformer condition-based maintenance pilot measurement plan.

Use this with the GridAPM Tools Hub

Start at https://www.gridapm.com/tools/ and capture the calculator output, evidence gaps, reviewer roles, and first pilot scope. The scorecard is intentionally non-financial: it measures evidence effort, review traceability, and work-package quality before any ROI claim.

Best fit

- Utilities, TSOs, DSOs, generation teams, data centers, oil and gas facilities, and industrial electrical teams preparing transformer CBM pilots.

- Asset managers comparing time-based maintenance routines with evidence-led maintenance review.

- Engineering leaders who need audit-ready evidence trails before AI-assisted recommendations become reportable decisions.

Boundary statement

- This PDF is not diagnostic advice and does not evaluate transformer condition.

- It is not financial advice, an ROI projection, an operating instruction, or a maintenance approval.

- Qualified engineers remain responsible for standards interpretation, final recommendations, and work authorization.

Suggested first action

Pick one transformer family or substation group, collect the latest approved evidence package, run the relevant GridAPM public tool, and complete pages 2-5 before a pilot scoping call.

1. Translate Calculator Result Into Pilot Readiness

Use this page immediately after the public calculator. The goal is not to rate the transformer. The goal is to decide whether the evidence workflow is ready for a controlled GridAPM pilot.

0-39: Baseline inventory needed	Evidence is fragmented or reviewer ownership is unclear.	Build an evidence inventory and provenance map before AI-assisted drafting.
40-69: Focused pilot candidate	Enough evidence exists for a bounded workflow, but gaps need explicit treatment.	Run a narrow pilot on one asset class, station, or maintenance window.
70-100: High readiness for structured review	Inputs, reviewer path, and source context are relatively mature.	Prepare a human-reviewed evidence pack and scorecard for pilot approval.

GridAPM pilot promise boundary

GridAPM can help organize approved evidence, draft review packages, and preserve human signoff in a local-first workflow. It should not be represented as autonomous transformer control, final diagnostic authority, a guaranteed failure-prevention system, or a guaranteed ROI engine.

Pilot setup notes

[ ] Target assets or substations are named internally, but public worksheets avoid confidential identifiers.

[ ] Evidence owners are named: DGA/oil, PRPD/PD, SFRA, thermal/loading, inspection, maintenance history, CMMS/EAM, operations context.

[ ] Review roles are named: transformer SME, maintenance planner, asset manager, operations contact, data/security owner.

[ ] A decision meeting is scheduled before any recommendation becomes reportable or actionable.

2. Baseline Measurement Sheet

Capture the current manual workflow before introducing GridAPM. These measurements help a utility judge whether an AI-assisted evidence workbench is improving review quality and reducing avoidable rework.

Assets in scope		Asset class, voltage group, station group, or maintenance program.
Evidence streams currently used		DGA, oil quality, PRPD/PD, SFRA, loading, inspections, work history.
Systems touched per review		Lab portal, historian, CMMS/EAM, document repository, spreadsheets, emails.
Average evidence assembly time		Measure effort before recommendations are drafted.
Reviewer questions per package		Count missing provenance, unclear timestamps, units, missing trends, or conflicting data.
Rework cycles before approval		Count package revisions before an engineer can approve, reject, or escalate.
Final decision artifact		Report, work package, CMMS note, engineering memo, risk register update.

Suggested measurement rule

Measure the same workflow for at least one before/after cycle. Keep the comparison about evidence handling and review quality unless the utility has a separately approved financial model.

3. Pilot Value Matrix

Use the matrix to describe value without overclaiming. Strong pilot value usually appears as faster evidence assembly, fewer unresolved reviewer questions, clearer source provenance, and more consistent work-package structure.

Evidence assembly	Can approved data be collected with fewer manual hops?	Time to assemble a complete evidence set.	Down or more predictable.
Traceability	Can reviewers see where each claim came from?	Percent of claims linked to source, timestamp, unit, and owner.	Up.
Work-package quality	Does the package answer common reviewer questions?	Reviewer questions, rework cycles, missing-field rate.	Down.
Human approval	Is signoff clear before output becomes reportable?	Approver, status, edit history, escalation reason captured.	Up.
Pilot governance	Are AI boundaries clear to OT/security teams?	No-upload posture, data handling notes, local-first workflow records.	Documented.
Learning loop	Does closeout improve the next review?	Closed work-order lessons attached to future evidence packs.	Up.

Avoid unsupported claims

Do not present pilot measurements as certified diagnostics, guaranteed outage reduction, guaranteed emissions reduction, autonomous maintenance approval, or production ROI unless those claims are independently validated and approved by the customer.

4. 30-Day Scorecard

Use this table during the first month of a controlled evaluation. The scorecard is meant for internal pilot governance and executive visibility, not final engineering judgment.

Week 1	Confirm asset scope, approved evidence, and data handling boundary.	Asset count, evidence streams, data owners, reviewer names.	Proceed / narrow scope / pause for data owner approval.
Week 2	Assemble baseline evidence package manually and record friction.	Assembly time, systems touched, gaps, questions.	Approve baseline record.
Week 3	Use GridAPM-style structure to draft a human-reviewed evidence package.	Linked evidence fields, reviewer comments, rework cycles.	Approve, edit, reject, or escalate draft.
Week 4	Compare baseline vs pilot package and decide next pilot step.	Evidence coverage, traceability, reviewer confidence, closeout notes.	Expand / repeat / stop / refine evidence ingestion.

Decision meeting template

[ ] What evidence was most useful for the engineering review?

[ ] Which gaps blocked a confident recommendation or maintenance package?

[ ] Which AI-drafted statements required correction, rejection, or extra source evidence?

[ ] Which measurements improved enough to justify a larger pilot?

[ ] Which security, OT, data handling, or reviewer controls must be strengthened first?

5. Evidence Checklist and Source Context

The checklist below helps teams decide what evidence belongs in the pilot packet. Standards and public guidance should be interpreted by qualified personnel using licensed copies and internal procedures where applicable.

DGA and oil quality	Sample date, lab, units, method, gases, limits/context, trend reference.	Use standards-aware interpretation only with qualified review.
PRPD / partial discharge	Measurement date, test setup, pattern record, operating context, reviewer note.	Avoid treating a public worksheet as PD diagnosis.
SFRA / electrical tests	Date, instrument, connection setup, baseline or comparison trace, interpretation owner.	Preserve original files where possible.
Thermal and loading	Load history, ambient context, hotspot/thermal assumptions, operating limit reference.	Connect to asset-criticality context.
Inspections and maintenance history	Inspection notes, work order IDs, corrective actions, closeout evidence.	Capture closeout learning for future evidence packs.
Approval path	Reviewer names or roles, decision status, edit trail, escalation path.	Human review must be visible before reportable decisions.

Source context

NIST AI Risk Management Framework: https://www.nist.gov/itl/ai-risk-management-framework

NIST Cybersecurity Framework 2.0: https://www.nist.gov/cyberframework

NIST SP 800-82 Rev. 3, Guide to Operational Technology Security: https://csrc.nist.gov/pubs/sp/800/82/r3/final

DOE Large Power Transformer Resilience Report: https://www.energy.gov/sites/default/files/2024-10/EXEC-2022-001242%20-%20Large%20Power%20Transformer%20Resilience%20Report%20signed%20by%20Secretary%20Granholm%20on%207-10-24.pdf

IEEE C57.104-2019, guide for dissolved gas interpretation: https://standards.ieee.org/ieee/C57.104/7476/

IEC 60599:2022, mineral-oil filled equipment gas interpretation: https://webstore.iec.ch/en/publication/66491

IEEE C57.91-2011, loading guide: https://standards.ieee.org/ieee/C57.91/5297/

IEEE C57.149-2024, frequency response analysis guide: https://standards.ieee.org/ieee/C57.149/7354/

Next step

Use this scorecard with the Human-Reviewed Transformer Evidence Pack Template, then request a controlled pilot discussion at https://www.gridapm.com/pilot/ or https://www.gridapm.com/#contact.