Data & AI Readiness Audit for Metals, Mining & Process Industries

Turn years of process data into a clear, prioritized roadmap for AI that actually delivers value

---

Why this matters

Many industrial AI initiatives fail not because the algorithms are weak, but because the data and foundations are not ready. In metals, mining and process industries, this shows up as:

- Expensive pilots that never scale beyond a single line or asset.
- Vendors bringing “generic” AI models that do not match your process reality or data constraints.
- Years of historian and lab data but little that is actually usable for robust models.

A structured **Data & AI Readiness Audit** gives you a fact-based view of where you stand today and where AI can realistically create value with the data you have (or can get).

The approach

This audit is designed specifically for metallurgy, metals production, mining and related process industries, not as a generic IT assessment.

The approach combines: **Process & materials expertise + Data & system expertise.**

It provide you with AI application strategy, knowledge of what types of models (including physics-informed and hybrid ML) are realistic at different levels of data quality and maturity.

Who this is for

This audit is ideal if you:
✓ Are considering or already running AI initiatives in metals, mining or process industries
✓ Have experienced stalled or disappointing AI pilots and want to understand why
✓ Are unsure whether your data is actually ready for the AI use cases you're targeting
✓ Need a clear, executive-friendly view of where to focus in the next 6–12 months
✓ Want to identify what to fix in data and systems before investing further in AI

Detailed Process & Timeline

Typical engagement: 4 - 6 weeks from kickoff to final presentation

Phase 1: Discovery & Scoping (Week 1)

What we do:

- Clarify your business goals, pain points and AI expectations (maintenance, quality, energy, throughput)
- Map key plants, assets and processes in scope
- Identify relevant systems (historians, SCADA/DCS, MES, LIMS, maintenance, planning)
- Define success criteria and timeline

What you provide:

- 60–90 minute discovery meeting with operations/tech leadership and data/IT teams
- Overview of current AI/digitalization initiatives
- Key contacts for operations, maintenance, quality, IT/OT and data

Phase 2: Data Landscape Mapping (Week 2)

What we do:

- Inventory available data sources and systems per plant/line/asset
- Document data flows and identify integration points and gaps
- Produce a high-level "data map" for the audit scope

What you provide:

- System architecture diagrams (if available)
- Short technical sessions with system owners (historian, SCADA, MES, LIMS, etc.)
- Read-only access or data extracts under NDA

Phase 3: Deep Data Quality Assessment (Weeks 3 - 4)

What we do:

- Analyze sample datasets to assess: completeness, accuracy, consistency, time alignment, outliers and drift
- Check how well process data can be joined to lab/quality and maintenance data
- Assess data suitability for different AI approaches (physics-informed, hybrid ML, pure ML)

What you provide:

- Data extracts or secure access for a representative period
- Clarifications from engineers on how signals are used and maintained
- Any existing data quality rules or previous analyses

Phase 4: Use-Case & Readiness Mapping (Week 5)

What we do:

- Facilitate workshops to identify and refine AI use-cases (predictive maintenance, quality, digital twins, optimization)
- For each use-case, assess: value potential, data readiness, organizational readiness, and risk
- Build prioritization matrix (value vs. feasibility) and link to data requirements

What you provide:

- Participation from operations, maintenance, quality, engineering and business stakeholders
- Input on pain points, opportunities and constraints
- Feedback on preliminary prioritization

Phase 5: Synthesis & Roadmap (Week 6)

What we do:

- Compile comprehensive Data & AI Readiness Report with executive summary, data findings, use-case portfolio, and 90-day/12-month roadmap
- Present findings and recommendations to leadership and stakeholders

What you provide:

- Time for review/feedback session on draft findings
- Participation in final presentation/Q&A (on-site or online)
- Decision on next steps (internal execution, pilot support, further workshops)

Deliverables

All deliverables are provided in formats suitable for both executive decision-making and practical follow-up by engineering, maintenance, quality and data/IT teams.

You will receive:

- Professional PDF report (25–35 pages) with executive summary and detailed findings
- Executive presentation deck (15–20 slides) for leadership and stakeholder briefings
- Prioritization matrices and roadmap templates (Excel/PowerPoint) you can update and adapt
- All charts, diagrams and visualizations as exportable files for your internal use

1. Data Readiness Report

A structured assessment of your data landscape and quality, showing:

- Executive Summary
- Clear, non-technical overview of key findings, risks and recommendations for leadership
- Data Landscape & Quality Analysis
- Overview of all in-scope systems (historian, SCADA/DCS, MES, LIMS, maintenance, planning)
- Data quality per area: completeness, accuracy, consistency, time alignment, outliers and drift
- Ability to reliably link process, lab/quality and maintenance data
- Per-Asset/Line Findings (where applicable)
- Focused assessment showing how "AI-ready" each major asset, line or process area is

Typical insights we uncover:

"Only ~30% of failure events can be reliably linked to process history due to missing or inconsistent logs"

"Critical sensors for quality are not time-aligned with lab results, limiting supervised ML options"

"Two assets/lines are AI-ready with current data; three require instrumentation or integration upgrades first"

"Historical data before year X is not comparable due to process and sensor changes"

2. AI Opportunity & Risk Map

A concise prioritization of where AI can realistically create value—and where blockers remain:

➔ Use-Case Portfolio

Potential AI applications tailored to your operations (predictive maintenance, quality, process optimization, digital twins, supply chain, microstructure/materials)

➔ Prioritization Matrix

Each use-case scored on:

- Value potential (impact on safety, quality, throughput, cost, energy)
- Feasibility (data readiness, complexity, organizational readiness)
- Risk (technical, organizational, regulatory)
- Visual 2×2 or 3×3 chart showing "quick wins," "strategic bets," and "park for later"

➔ Risk Overview

Key risks per use-case: data gaps, model risk, change management, vendor dependencies

3. Roadmap & Governance Recommendations

A practical plan for the next 6–12 months:

➔ 90-Day Action Plan

- Quick wins in data quality and integration
- 1–2 candidate pilot projects with realistic scope
- Concrete actions, owners and success criteria

➔ 12-Month Roadmap

- Sequencing of AI initiatives (what to start, continue, or postpone)
- Required data and system improvements (sensors, logging, data modeling)
- Where physics-informed or synthetic data approaches may be beneficial

➔ Governance & Operating Model

- Suggested roles and responsibilities (operations, data/IT, maintenance, quality, leadership)
- Collaboration model with external vendors and partners
- Guidelines for monitoring, model lifecycle and continuous improvement

---