

■ Predictive Maintenance Technology Selector

Technology	Detects	Best For	Typical Lead Time
Vibration analysis	Unbalance, misalignment, bearing/gear defects, looseness	All rotating machinery	Weeks to months
Oil analysis	Wear metals, contamination, additive depletion, water	Gearboxes, engines, large bearings, hydraulic	Weeks to months
IR thermography	Hot spots: electrical, coupling, valve leakage, insulation	Electrical gear, recip valves, steam traps	Days to weeks
Ultrasound	Early bearing faults, air/gas leaks, electrical arcing, steam traps	Slow-speed bearings, leak surveys	Earliest bearing indicator
Motor current/ESA	Rotor bar defects, eccentricity, load anomalies	Critical motors	Weeks to months
Wireless sensors + ML	Continuous trend anomalies across fleet	Balance-of-plant coverage at scale	Model-dependent

■ P-F Curve Strategy

Potential failure (P) to functional failure (F) interval sets your inspection frequency: **monitoring interval < P-F interval / 2**. Combine technologies to catch different failure modes - ultrasound and oil analysis typically detect earliest, vibration confirms and diagnoses, thermography verifies late-stage.

■ Program Health Metrics

Metric	Target Direction
% work orders from PdM findings (proactive ratio)	Rising - shows program driving work
Repeat failures on monitored equipment	Near zero - repeat = missed root cause
Alert-to-action time	Falling - findings must convert to planned work
Collection route compliance	> 95% - data gaps blind the program