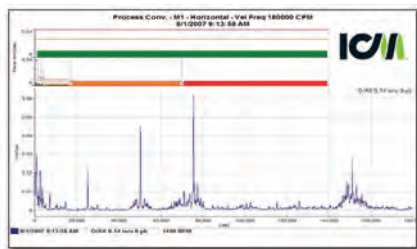




Maintenance Solutions: Predictive Maintenance

ICM offers predictive maintenance/condition monitoring solutions that utilize the latest technology.

- Vibration analysis
- Infrared imaging for inspections, focusing on your Gas-Fired Equipment, Electrical Panels, and Mechanical Inspections on your critical rotating equipment
- Mechanical Integrity Inspection (should be performed every 5 years to meet the requirements of OSHA Standards 29 CFR 1910.119(j) for Process Safety Management
- Balancing and Shaft Alignment Services



Example conveyor gear box vibration report



Predictive Maintenance not only identifies problems before they happen, it can also save your company operating expenses

Properly maintained equipment costs less to operate. Predictive maintenance techniques, including vibration tests and spectrum analysis, can be used to distinguish between bearing wear, shaft-misalignment, or electrically caused vibrations. It has been reported that a precision alignment can save power consumption by 1% to 3%. Improperly aligned bearings will decrease bearing life by up to 75%, which may also create stress on the motor shaft, which in turn takes more energy to operate. A properly run PDM Program offered by ICM will detect these problems through vibration analysis.

ICM offers a cost-effective, sustainable solution for your Predictive Maintenance Program. Trust the experienced analytical staff at ICM to provide timely, accurate results that provide insight to your machinery issues. Rely on the ICM industry knowledge to deliver the necessary repair recommendations to operate at optimum efficiency.

Infrared Inspections performed by Level I Certified Technicians

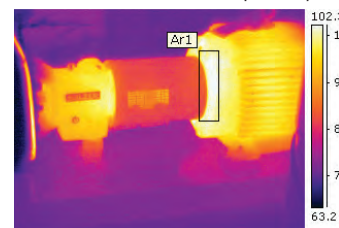
By using infrared photography, we can perform thorough inspections of your mechanical, structural, and electrical systems to check for abnormalities and early signs of wear.

Mechanical IR Inspections

Our Mechanical IR Inspection covers all major rotating equipment that is essential to your process, including pumps, agitators, conveyor drive systems, and other equipment that runs 24 hours per day.

It will identify:

- Coupling misalignment
- Belt misalignment and tension
- Pump bearing carrier and seal temperatures
- Motor temperatures with trending on suspect items
- Overheating bearings, shaft-mounted and internal gearbox temperatures
- Missing or damaged interior insulation, where applicable



Sample IR photography

Vibration Analysis

Vibration inspection scans can be performed monthly or quarterly, with monthly scans recommended. Quarterly vibration analysis is less expensive, but it does increase the potential for undiagnosed mechanical failures due to the longer interval. We can inspect drum drive units, centrifuges, pumps, and fans to identify:

- Misalignment
- Unbalance
- Backlash, eccentricity, and cracked/broken teeth in gearboxes
- Rotor/stator problems in motors
- Belt tension problems
- Cavitation and impeller wear
- Early bearing wear, bearing defects, potential bearing failures

We can also install permanently mounted vibration transducers on gearboxes, allowing your technicians to gather data from a convenient junction box next to each monitor.



Learn more these
and other products
ICM offers to meet
your facility's
needs!

**Call our Customer
Service department
today.**

877.456.8588

Electrical IR Inspections

Our Electrical IR Inspections includes all in-service MCC buckets that are not interlocked and can be inspected without powering down, such as MCC rooms, outside transformers, control cabinets, and sub stations. This inspection will identify:

- Line filter temperatures
- Overload temperatures
- Faulty electrical connections
- Transformer temperatures and oil levels
- Capacitor bank fuse connections
- Faulty connections of MCC disconnecting breakers to the main bus can also be indirectly identified

Fuel-Fired Equipment IR Inspections

Our IR Inspection can help prevent excessive plant downtime caused by unexpected failures of critical equipment through early detection of insulation failure. This inspection covers:

- Boilers, thermal oxidizers, dryers, burners, and associated duct work

Comprehensive Mechanical Integrity Program

ICM uses our experienced staff to design and build a structured, unified solutions to meet your facility's requirements for the Mechanical Integrity (MI) component required in Process Safety Management (PSM) at a price below what an in-house effort would cost. Our program includes:

- Identification of all tanks, vessels, piping systems, valves, vents, reliefs, controls, and pumps that fall under the MI aspect of PSM
- Establishment of a structured criticality rating system and rating of each component consistent with sound engineering practice
- Identification of manufacturer, manufacturer part number, or design specification for each component
- Identification of inspection and testing procedures and practices for each component, starting with those identified as most critical
- Determination of frequency and establishment of a documentation method for each test or procedure
- Establishment of a Management of Change (MOC) procedure that will ensure that anticipated work performed is consistent with design specifications and manufacturer's instructions

Wall-Thickness Testing

ICM offers a wall-thickness testing service as part of our overall Mechanical Integrity program or as a stand-alone service. This service will help improve plant safety by assuring that all equipment is within safe limit thresholds, and it meets insurance requirements.

Ultrasonic Leak Detection

Ultrasonic leak detection is used to find minute compressed air leaks. The technology is helpful when troubleshooting valves or other sources of vacuum leaks, and can be used to detect efficiency loss on sieve valves.



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