



# Field Service

Products & Services

# Comprehensive Solutions Partner



Why take chances with your critical processes and equipment? Since 1937, Magnetech has provided repair, reconditioning, and remanufacturing of electrical-mechanical equipment for customers throughout North and Central America. Our broad experience with all types and brands of electrical, mechanical and power system equipment will keep you up and running. To ensure safe and reliable services, choose a trusted partner. Choose Magnetech.

## Motor & Generator

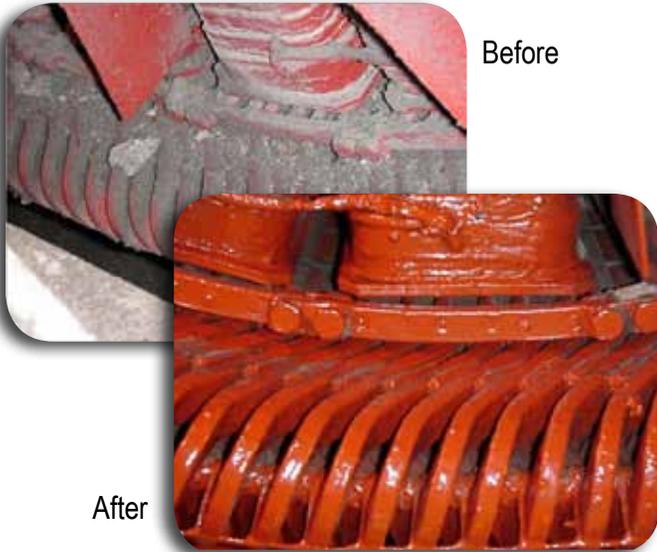
- ▶ Borescope Inspection
- ▶ Emergency callout, 24/7
- ▶ Equipment installation, commissioning, and removal
- ▶ Infrared Thermal Imaging
- ▶ Laser Shaft Alignment
- ▶ Oil Analysis
- ▶ PdMA Motor Circuit Evaluation (MCE) & Emax Electrical Testing
- ▶ Preventative & Predictive Maintenance
- ▶ Scheduled outage service
- ▶ Total Motor Maintenance
- ▶ Ultrasonic Examination
- ▶ Vibration Analysis

## Power System

- ▶ Failure Analysis
- ▶ Main Substation Maintenance & Testing
- ▶ On-Site Bus Fabrication
- ▶ On-Site Circuit Breaker Services
- ▶ Shutdown and Outage Maintenance
- ▶ Thermographic Inspection and Analysis
- ▶ Turnkey Switchgear Installations

## Transformer

- ▶ Bushing Replacements
- ▶ Coolers, Valves, Fans, Controls, Wiring and Accessories replacements
- ▶ Electrical Testing
- ▶ Internal Inspection and repair
- ▶ Lead Repair
- ▶ Load Tap Changer (LTC) Inspection & Maintenance
- ▶ Mechanical Services
- ▶ No Load Tap Changer (NLTC) Repair
- ▶ Oil Reclamation, Oil Dehydration, Oil Degasification
- ▶ Pump rebuild and replacements
- ▶ Re-Blocking
- ▶ Transformer Regasketing
- ▶ Turnkey Services
- ▶ Vacuum Filling and Dry-Out



Before

After

## Dry Ice Blasting

Magnetech offers dry ice blasting services to bring life back to your equipment. Unlike other types of equipment cleaning, dry ice blasting does not pit, damage, erode or wear away the surface of your equipment. It is an environmentally safe way to remove paint, decals, soot, dirt, ink, adhesives, organic materials, mold, mildew and algae that retards re-growth of bacteria, fungus, and minimal organic matter. Dry ice blasting can even be performed on delicate electrical components or remove thick layers of contaminants on heavy industrial equipment.

## Magnetech Overhead Crane System Maintenance Program

Magnetech overhead crane technicians are professionally trained, certified, and available to develop a customized preventive maintenance program for your system to: eliminate system failures, extend equipment service life, and reduce downtime and repair costs with regular inspections and service. Service technicians are able to inspect hoist, rope & hook with magnetic particle testing, perform OSHA inspections, inspect controls and structure, and modernize and upgrade your system.

Magnetech schedules regular visits by a technician to examine, test and perform routine maintenance on your cranes to meet or exceed the original manufacturer's specifications. We then provide you with a written report after each inspection that details equipment condition and includes any recommended action.



## Fan Maintenance Services

As units age, attention to machine condition and maintenance becomes imperative. With the cumulative and progressive nature of stress, wear, and fatigue, regular inspections and attentive maintenance ensures continued satisfactory operation. At Magnetech Industrial Services, we are available 24/7 to respond with trained professionals to evaluate your equipment and recommend activity to minimize downtime and permit the most effective use of time and labor.

### Capabilities- Centrifugal/ Axial Fans

- ▶ Turnkey/Fan/Rotor Removal
- ▶ Laser Alignment -Leveling
- ▶ Bearing Analysis, Change out, Installation, and Rebabbiting
- ▶ Shaft Repair - Fabrication- Installation
- ▶ Coupling Machining- Installation
- ▶ Dynamic Balancing to ANSI and ISO Standards (Field/Shop)
- ▶ Vibration Analysis- Data Collection



# Preventative & Predictive Maintenance

Breakdowns and failures cause costly unscheduled downtime. Magnetech Industrial Services provides a comprehensive predictive/preventative maintenance program that can greatly reduce the threat of downtime. Our engineers and state-of-the-art equipment can detect problems and repair them prior to a failure.

## Vibration Analysis

Mechanical and electrical problems will eventually develop in all rotating equipment. Vibration levels will increase and occur at specific frequencies that relate to the type of developing fault. Our vibration analyzer will measure both vibration frequency and severity.

Potential Problems that can be identified and corrected through vibration analysis include:

- ▶ Roller bearing defects
- ▶ Rotor imbalance
- ▶ Worn belts or sheaves
- ▶ Resonance
- ▶ Bent shafts
- ▶ Load imbalance
- ▶ Flow deficiencies in pumps & fans
- ▶ Component misalignment
- ▶ Gear mesh irregularities
- ▶ Inefficient system coordination

## Oil Analysis

Oil analysis is something Magnetech obtains from machinery at regular intervals- while the machine is operating- to obtain true samples of "active oil". The information obtained from each oil analysis is combined with vibration data, thermal imaging, electrical and other testing methods to provide a more accurate assessment of condition. Test results are entered into a database, stored and trended.

## Ultrasonic Examination

Magnetech technicians are able scan an area and identify problems such as gas leaks, vacuum leaks, valve leaks and similar problems.



## Physical Inspections

Careful examination of the entire machine is critical to an accurate evaluation of component condition. Using observed physical characteristics and predictive maintenance data, Magnetech technicians can provide valuable information on potential problems. Magnetech crews can conduct routine inspections through a mutually agreed PM schedule.

## Infrared Thermal Imaging

Conducted under load, this technology views energy emissions from operating equipment and transforms the information into a color-coded map. Reports then capture temperature differences between problem areas and baseline values.

## Electrical Testing

Our technicians can handle all your motor testing needs using either a PdMA Motor Circuit Evaluator (while the unit is off-line) or a PdMA Emax Tester (when a unit is on-line), providing graphs of data trends and comparison reports in the field to analyze power quality, power circuit condition, stator health, and motor efficiency.

## Laser Shaft Alignment

Precision alignment is proven to deliver significant cost savings in electricity, machine repair, and downtime. Symptoms of misalignment include: excessive vibration, high bearing temperatures, loose foundation bolts, excessive oil leakage at seals, excessive coupling temperature and wear, shafts breaking at inboard bearings, and premature bearing seal & coupling failure.

# Preventative & Predictive Maintenance

## MCE Testing

With electrical faults responsible for nearly half of all motor failures, taking a proactive approach to these problems becomes a necessity. Motor Circuit Evaluation (MCE) is a predictive maintenance technology which provides comprehensive, portable motor testing. MCE allows you to test de-energized electric motors (large or small, AC or DC), and determine the condition of the motor and its associated power circuit in a short period of time. The data is immediately stored for trending, comparison and report generating. The MCE tester allows you to perform condition-based maintenance rather than time-based maintenance. This prevents motor failures and costly necessary maintenance. Like Emax testing, MCE testing is non-destructive.

MCE Testing can be performed for quality assurance, trending and diagnostic maintenance. Quality Assurance (QA) testing of motors, when they are new or refurbished, ensures that only the highest quality motors are placed into service. Trending motor health over time allows for repair or replacement of motors, prior to failure. This can prevent unexpected downtime and minimize costs associated with unexpected shut downs. When problems exist in a motor circuit, the MCE can be used to troubleshoot the current and narrow the problem down to a specific component or section of the motor circuit.

## Emax Testing

Often, it is not possible to shut down a motor to perform MCE testing. Emax allows testing motors while they are operating. Energized motor testing allows you to determine when the motor needs to be shut down for further testing and/or maintenance. Two types of energized motor testing are possible with Emax, current analysis and power analysis. Like MCE, Emax testing is non-destructive.

The Current Analysis portion of Emax takes current measurements of the three phases of an AC motor circuit. It can perform the following tests on AC motors operating at a recommended steady state load of greater than 70% of a full load:

### Low High Resolution

Low/High Resolution testing is performed to identify damage to rotor bars before causing secondary damage to the stator coils.

### Eccentricity Testing

Eccentricity testing is performed to determine motor eccentricity before damage to rotor, stator, and signs of motor degradation.

### In-Rush/Startup

In-Rush Startup testing is performed to monitor in-rush current and startup signatures, providing early signs of motor degradation.



# Repair Services

Need to get your equipment and systems back on line fast? Count on Magnetech's specialists for repair flexibility and quick response. Our experience in non-destructive evaluations and testing on large mechanical equipment will help us determine the repair work needed without costing you extra. We are able to dispatch our expert team for repairs on pumps, valves, fans, gearboxes and more 24/7 for all of your emergency repair needs. Our highly-trained maintenance technicians are experts at advanced troubleshooting techniques and root-cause analysis. Unlike OEMs, whose expertise is limited to their individual product line, we are knowledgeable on a broad range of machines and control types.



## On-Site Repair Services

- ▶ Specialty resources to meet your troubleshooting challenges
- ▶ Pump repair and re-builds: horizontal split case & vertical
- ▶ Air compressor repairs and rebuilds
- ▶ Generator and exciter repairs
- ▶ Gearbox repairs
- ▶ On-Site balancing and laser alignment
- ▶ Turnkey replacements

## Hydroelectric General Maintenance

- ▶ Repair or Rewind
- ▶ Exciter Recondition
- ▶ Dry Ice Cleaning
- ▶ PM & Scheduled Maintenance
- ▶ Clean, Tape or Re tie Present Windings
- ▶ Varnish Treat or Paint Windings & Core
- ▶ Re-Wedge Coils- Install New Fillers & Ripple Springs
- ▶ Core Testing EL-CID or Loop Test with Thermal Imaging
- ▶ Repair, Re insulate or Manufacture Bus Rings & Connections
- ▶ Manpower & Material for Complete On-Site Stator Rewinds



## Rotor Services

- ▶ Clean & Test Rotor Assembly & Coils
- ▶ Restack, Repair, Re insulate or Replace Core Laminations
- ▶ Repair or Replace Rotor Coils, Rotor Collars or Amortisseur Windings



## Stator Services

- ▶ Inspect & Test
- ▶ Rotor & Stator Alignments
- ▶ Partial or Complete Rewinds or Coil Repairs
- ▶ Restack, Repair, Re insulate or Replace Core Laminations

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### **Service Locations**

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