

# POWER THROUGH EXPERIENCE

MECHANICAL DYNAMICS & ANALYSIS



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Providing the technical resources  
needed to complete your next gas or  
steam turbine, or generator overhaul

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One-call access to global expertise  
and unparalleled service



# TURBINE-GENERATOR SPECIALISTS— WE ARE MD&A.

**F**or over 40 years, MD&A has enjoyed a reputation as a diligent leader throughout the power generation industry; employing innovators and experienced practitioners who are continually called upon for their knowledge and level of service that exceeds customer expectations.

We retain trusted experts with strong leadership skills and a recognized desire to complete your outage on time and within budget. Locating the right resources to effectively address turbine or generator technical issues can be accomplished with just one call.



# WHAT YOU NEED; WHERE YOU NEED IT.

**M**echanical Dynamics & Analysis (MD&A) provides power generators around the globe with a full-service, OEM-alternative for services, parts, and repairs for utility and industrial gas and steam turbines and generators. We deliver consistent quality and value with fast response, superior communications, and innovative solutions.

### MD&A Gas & Steam Turbine-Generator Repair Facility

3804 Weber Road  
St. Louis, MO 63125  
Ph: +1 (314) 880-3000

**Centrally located,** this one-stop shop is home for our generator services, gas turbine repair, steam-path services, field machining, steam turbine valve inspections, as well as our modern high-speed balance facility. The building contains overhead cranes, rotor elevator system, weld booths, two clean rooms, 100-ton lathe, high-voltage bushing refurbishment, and all field machining equipment.

### MD&A Parts

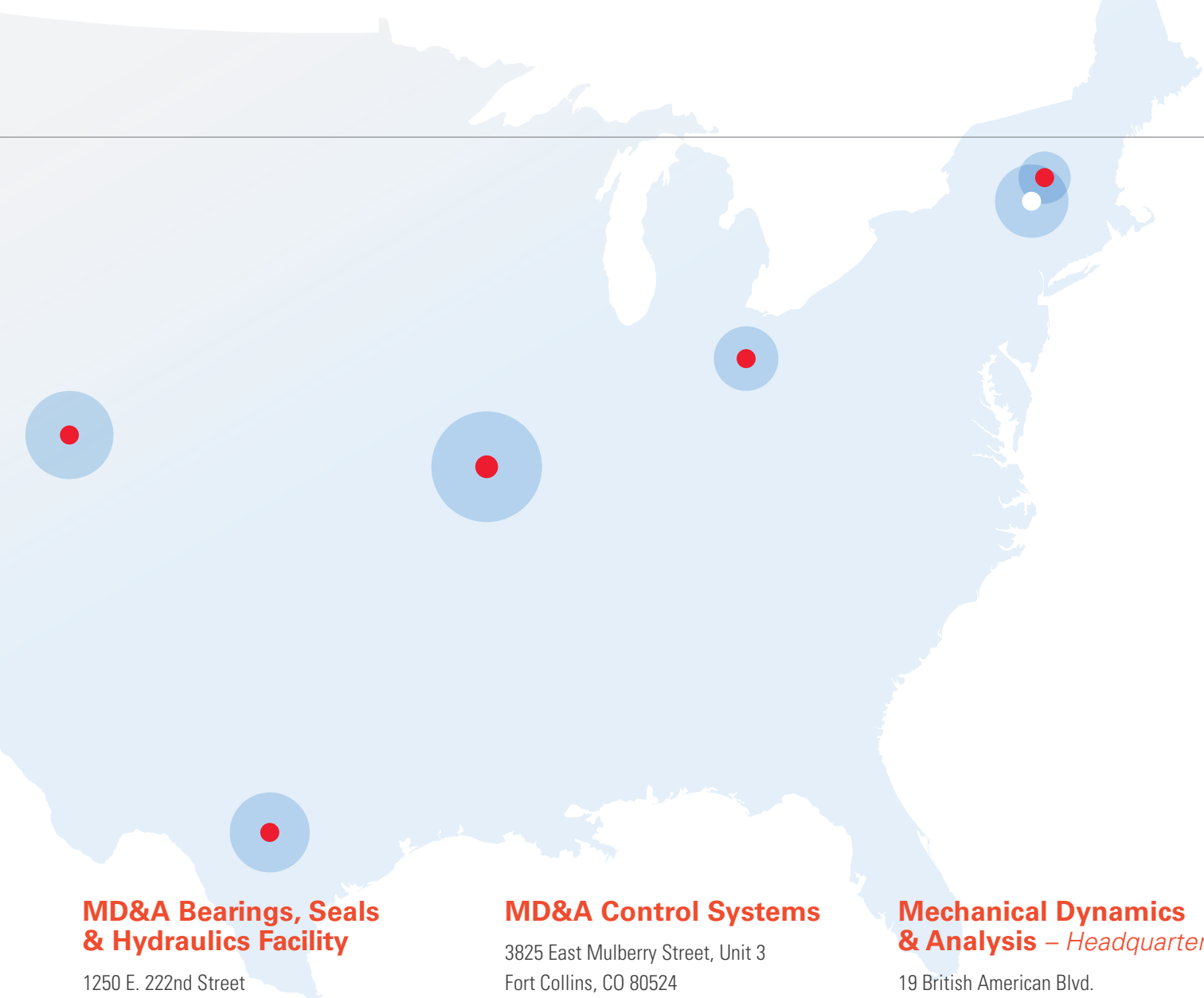
767 Pierce Road, Suite 2  
Clifton Park, NY 12065  
Ph: +1 (518) 885-3199

**Our Parts division** is a premier, global supplier of replacement gas and steam turbine and generator components across many OEMs. Our manufacturing facilities utilize state of the art equipment and are guided by a well-defined Quality Control process so that all of our products are of the highest quality available anywhere in the world.

### MD&A Gas Turbine Parts Service Facility

6948 Fairgrounds Parkway  
San Antonio, TX 78238  
Ph: +1 (210) 256-5000

**An industry leader in parts repair** and manufacturing, our San Antonio Service Center has leading edge equipment and repair techniques with proven expertise on multiple frame gas turbine hot gas path and combustion components. Our enhanced gas turbine new parts use proprietary advanced technology.



### **MD&A Bearings, Seals & Hydraulics Facility**

1250 E. 222nd Street  
Euclid, OH 44117  
Ph: +1 (440) 946-0082

### **Bearings, Seals & Hydraulics**

division is best known for high-quality bearing and seal ring restorations, along with specializing in the refurbishment of hydraulic control components, such as hydraulic actuators.

### **MD&A Control Systems**

3825 East Mulberry Street, Unit 3  
Fort Collins, CO 80524  
Ph: +1 (970) 224-2223

**Our Control Systems** division provides controls and excitation system engineering expertise, along with technical support, troubleshooting, installation, and training for gas and steam turbine and generator controls, as well as auxiliary control systems.

### **Mechanical Dynamics & Analysis – Headquarters**

19 British American Blvd.  
Latham, NY 12110  
Ph: +1 (518) 399-3616

**Located at our Headquarters,** MD&A's Outage Services division provides seasoned gas and steam turbine technical staff and field services to expertly disassemble, recondition and return to service heavy rotating equipment.

## GAS AND STEAM TURBINE SERVICES

**T**he worldwide power generation industry relies on MD&A for complete overhauls and upgrades of heavy rotating machinery. We provide clients with the labor, engineering and technical expertise to address both planned and forced outages of all types of turbines. Our technical directors and project managers are available 24 hours a day. Expedited engineering response and immediate turbine outage services are critical during forced outages.

EXPERTS  
WHEN  
YOU  
NEED  
THEM

SAFETY

THE HEALTH AND SAFETY OF OUR EMPLOYEES,  
OUR CUSTOMERS, AND THE ENVIRONMENT IS  
THE MOST IMPORTANT CORE VALUE AT MD&A.

## Gas Turbine Services

- Outage Planning
- Technical Direction
- Turnkey Inspections
- Gas Turbine Alignment
- End of Life Evaluations
- Compressor Vane Pinning
- Field Machining
- Balancing and Vibration Analysis
- Control and Excitation Field Engineering, Consulting and Training
- Root Cause Analysis
- Engineering Support
- Performance Testing and Analysis
- Long-term Service Agreements

With the combined commitment of management and employees, we lead with safety and operate each and every day to improve the working environment.

— Hugh Miles, *President and CEO*

## Steam Turbine Services

- Outage Planning
- Technical Direction
- Turnkey Labor
- Topless Alignment®
- Custom Installation of Seals
- Field Machining
- Balancing and Vibration Analysis
- Control and Excitation Field Engineering, Consulting and Training
- Steam Path Audits
- Engineering Support
- Remaining Life and Finite Element Analysis
- Thermodynamic Analysis
- Turbine Control Retrofits
- Turbine Foundation Monitoring
- Acceptance Testing



# GENERATOR SERVICES

**F**or **electric utility-sized** and industrial generators, MD&A provides generator specialists to conduct full-scope electrical testing, visual inspections and specialty tests as per customer requirements. We employ trained and skilled experts who approach every challenge with the experience gained from hundreds of successful projects.

- Outage Planning
- Technical Direction
- Turnkey Labor
- Generator Testing and Inspections
- Balancing and Vibration Analysis
- Control and Excitation Field Engineering, Consulting and Training
- Generator Excitation Retrofits
- Turbine Foundation Monitoring









# PARTS SOLUTIONS 24/7

# GAS TURBINE PARTS

**T**urn to MD&A, a premier, worldwide supplier of replacement turbine parts and components. Specializing in the manufacture and supply of turbine components, we can support your gas turbine parts requirements, across both capitals and consumables.

Our gas turbine parts service facility in San Antonio, Texas can provide upgraded components for high-tech units using proprietary alloys and coatings that can prolong service intervals and can extend the part's life.



- Combustion Parts
- Compressor Parts
- Turbine Parts
- Upgraded Suite of Parts
- Gas Turbine Bearings
- Oil Deflectors
- Fasteners
- Legacy Turbine Circuit Boards, Repairs and Service

EXPERTS SINCE 1982

OVER **40** YEARS OF  
EXPERIENCE

IN POWER GENERATION INDUSTRY

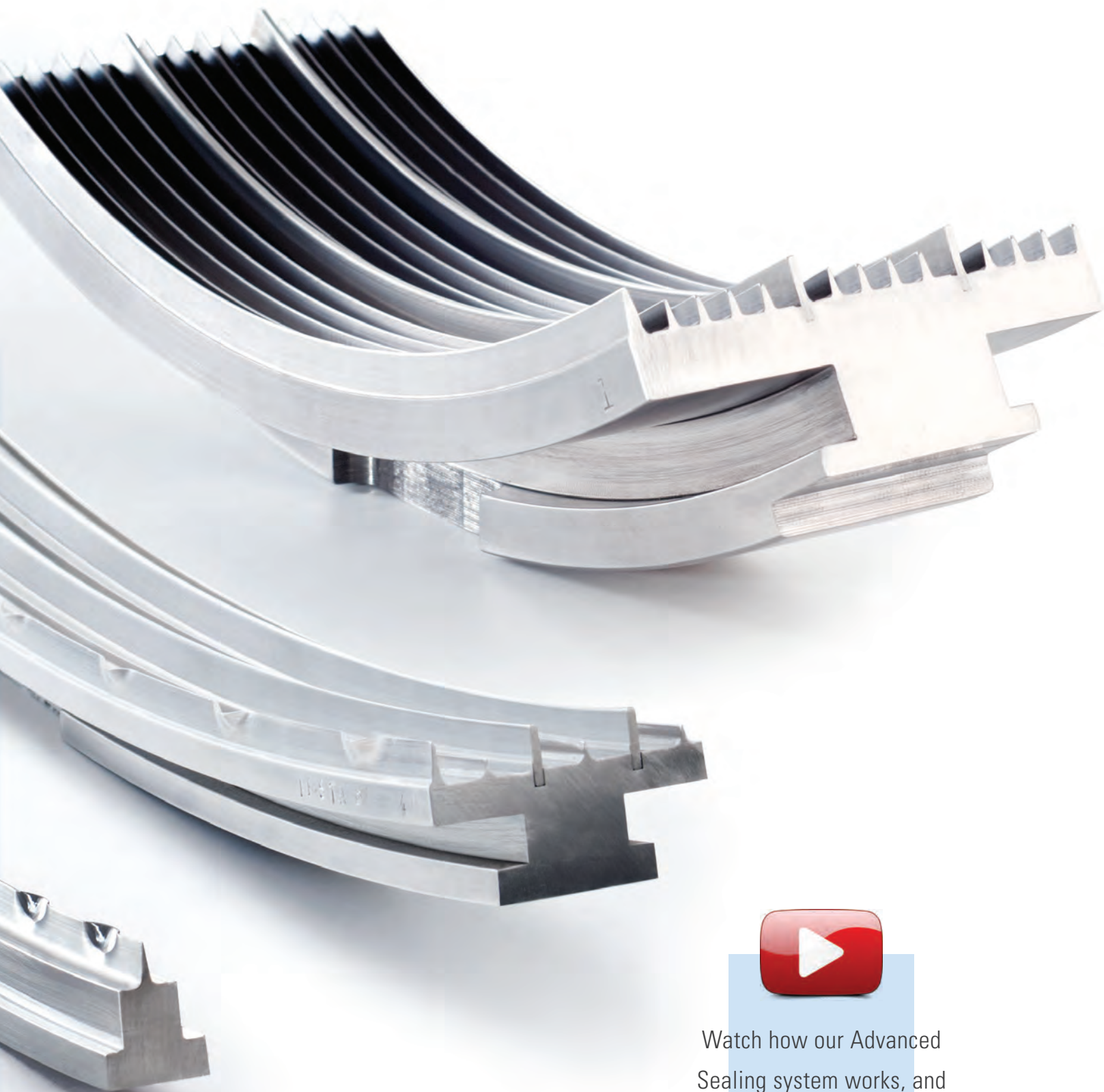


# STEAM TURBINE PARTS

**A**ddress **reliability**, life extension and capacity demands with our retrofit and turbine part solutions for large steam turbine generators. Load demand, financial pressures and aging steam turbine generators have created the need to extend longevity and reliability. From fasteners to valves and steam seals to buckets, look to MD&A for all your steam turbine parts needs.

- Steampath Components
- Stationary Components
- Valve Components
- Main Stop Valve Upgrade
- Guardian® Packing
- Vortex Shedder® Spill Strips
- Conventional Packing and Spill Strips
- Custom Seal Installation
- Tapered Land Thrust
- Tilt Pad Thrust
- Elliptical Journal
- Tilt Pad Journal
- Oil Deflectors
- Bronze Seal Rings
- Fasteners
- Legacy Turbine Circuit Boards, Repairs and Service
- Steam Turbine Retrofits





Watch how our Advanced  
Sealing system works, and  
other instructional videos at  
[www.MDATurbines.com/videos](http://www.MDATurbines.com/videos).

SATISFACTION

4.3 OUT OF 5

CUSTOMER RATING OF  
MD&A'S OVERALL PERFORMANCE  
SINCE 2009





## GENERATOR PARTS— ELECTRIC UTILITY AND INDUSTRIAL

**E**lectric utility and industrial generators require high-quality replacement components and generator parts if they are to run reliably between extended outage intervals. We offer a substantial range of electric generator replacement parts. As a turnkey provider of stator and field rewinds, we act as a single-source provider of all materials and components needed to complete these projects.

- Generator Stator Bars
- Collector Rings
- Hydrogen Seal Rings and Assemblies
- Insulated Bearing Rings
- Oil Deflectors
- HV Bushings and Auxiliaries
- Fasteners
- Miscellaneous Generator Components
- Generator Retrofits and Replacements
- Legacy Turbine Circuit Boards, Repairs and Service

# GAS TURBINE REPAIRS

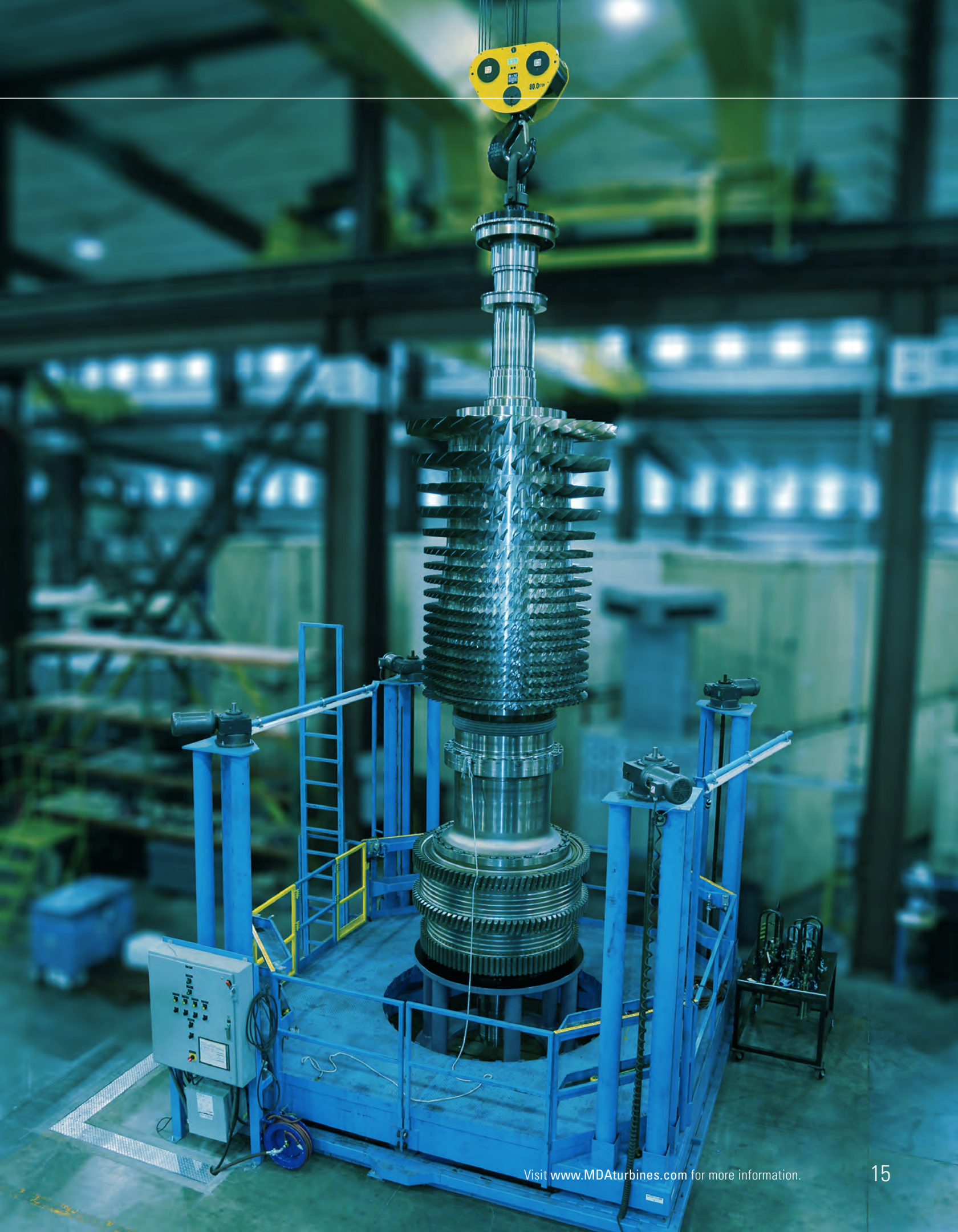
**O**ur engineers strictly follow effective, time-tested principles that produce superior repair solutions for gas turbine-generator rotors and components. We invest heavily in the development of people, procedures and principles which facilitate improvements in design, reliability and performance.

- Rotor Repair
- Component Repair
- Portable Machine Shops
- Machining Services
- High-Speed Balance
- Gas Turbine Bearings
- Tapered Land Thrust
- Tilt Pad Thrust
- Elliptical Journal
- Tilt Pad Journal
- Oil Deflectors
- Bronze Turbine Seal Rings

# EXPERTISE BORN OF EXPERIENCE











LOYALTY

**4.8** OUT OF **5**

CUSTOMERS, SINCE 2009,  
LIKELY TO SPECIFY/RECOMMEND  
MD&A IN THE FUTURE



# STEAM TURBINE REPAIRS

**F**or more than four decades, MD&A has been providing steampath turbine repair services. Our engineers make steam turbine repair recommendations based upon the owner's intended operating plans for the unit. We maintain a staff of experienced full-time steampath engineers who specialize in the engineered repair of stationary and rotating components.

- Portable Machine Shops
- Machining Services
- Stationary Component Repair
- Rotating Component Repair
- Rotor Straightening
- Casing/Shell Analysis and Renovation
- Advanced Rotor Welding
- Distortion Correction
- High-Speed Balance
- High Pressure Valve Repair
- Turbine Valve Actuators
- Steam Seal Regulator
- MHC Operating Governor
- Control Pac Power Actuators
- Overspeed Governor
- Control Rotor
- Tapered Land Thrust
- Tilt Pad Thrust
- Elliptical Journal
- Tilt Pad Journal
- Oil Deflectors
- Bronze Turbine Seal Rings



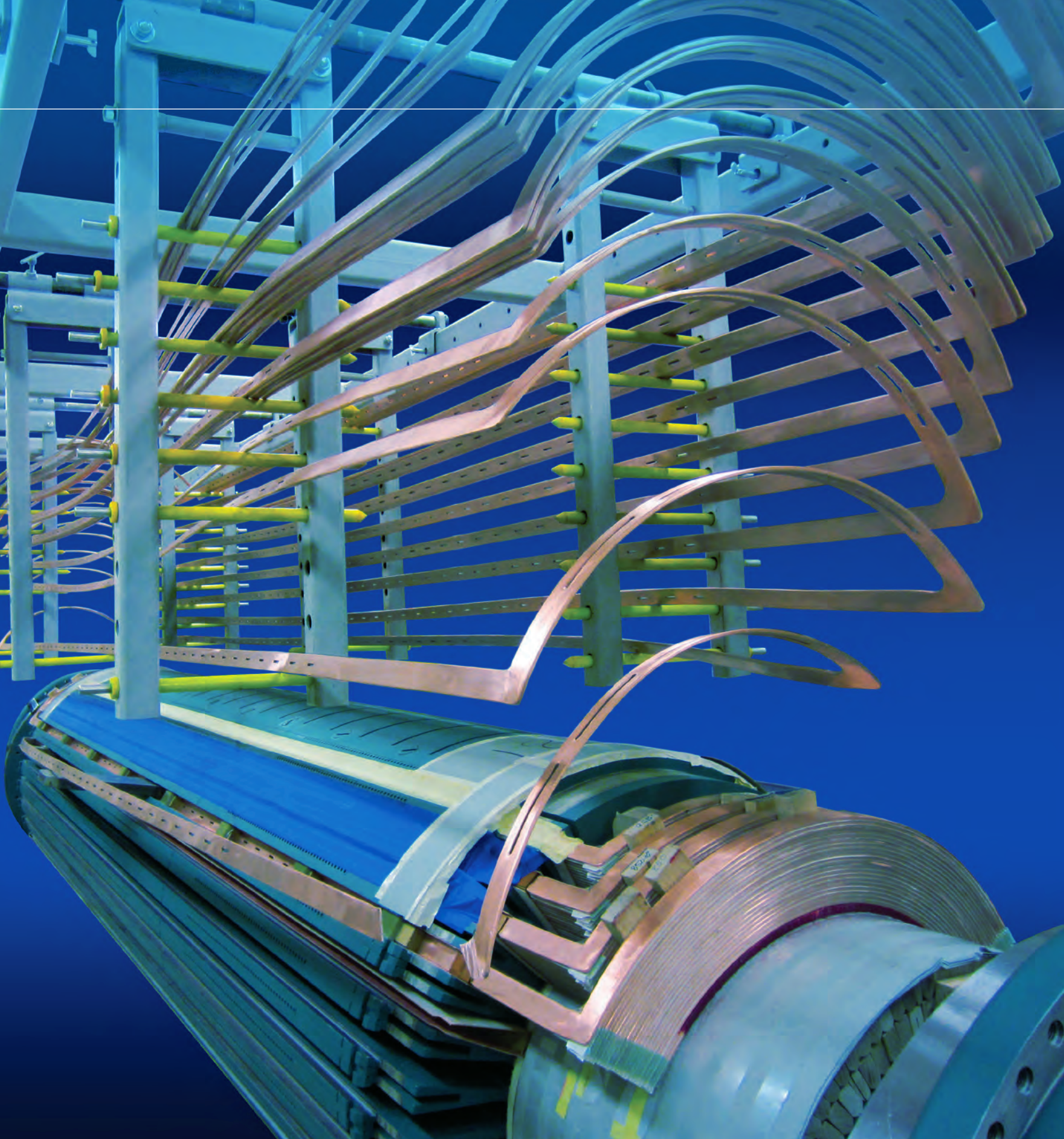
# GENERATOR REPAIRS

**W**e provide comprehensive refurbishment and repair of large utility and industrial generator stators and fields, and high-voltage bushing refurbishment. MD&A provides turnkey overhaul of water, hydrogen and conventionally-cooled utility generators up to 1300 megawatts. Our Turbine-Generator Repair facility has two new generator clean rooms to accommodate multiple field rewinds at a time.

- Stator Repair
- Generator Field Repair Services
- Stator Bar Water Leaks
- Rotor Slot Dovetail Repair
- High-Voltage Bushings and Auxiliaries
- High-Speed Balance with heat run capability/High-Speed Thermal Test (HSTT)
- Hydrogen Seals
- Elliptical Journal
- Tilt Pad Journal
- Oil Deflectors









## High-Speed Balance Facility

**Vacuum capable** for the high-speed balance of turbine rotors, along with full High-Speed Thermal Test (HSTT)/heat run capability for electrically testing generator rotors at speed.



## WHY MD&A?

**Around the corner or around the globe,** MD&A addresses all of your turbine or generator needs with one call. Count on prompt, thorough communication and follow-through. For every repair job, large or small, the speed and effectiveness of our response team is matched only by the depth and breadth of our engineering expertise.

Find out why so many power generators use MD&A to maximize operational effectiveness. *Contact MD&A today.*



Visit [www.MDAturbines.com](http://www.MDAturbines.com) for more information.

24-hour access to all MD&A resources and divisions. Please call **+1 (518) 399-3616** and follow the touch-tone instructions. Our staff will respond quickly and your call will be returned promptly at any hour, day or night.

Learn much more from our turbine-generator experts' case studies and tips by signing up for our Insight Newsletter at [www.MDAturbines.com](http://www.MDAturbines.com).



## MECHANICAL DYNAMICS & ANALYSIS

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