

ST. LOUIS HIGH-SPEED BALANCE FACILITY

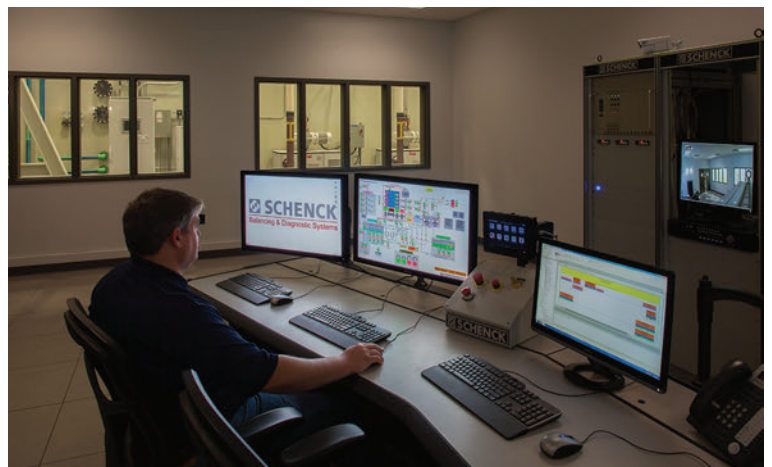
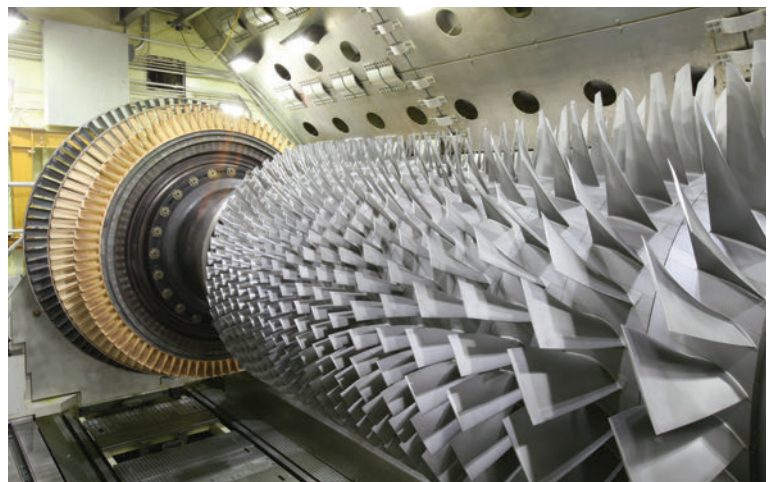
MD&A Turbine-Generator Repair Facility

The newly constructed Mechanical Dynamics & Analysis (MD&A) High-Speed Balance Facility in St. Louis is one of the most modern balance facilities for power turbines in the United States. MD&A's St. Louis facility was designed with both vacuum capability and the ability to excite generator rotors at high-speed, allowing the testing and balancing of both gas and steam turbine and generator rotors. Centrally located in St. Louis, the High-Speed Balance facility is easily accessible nationally to better serve the US power generation installed base.

Operations

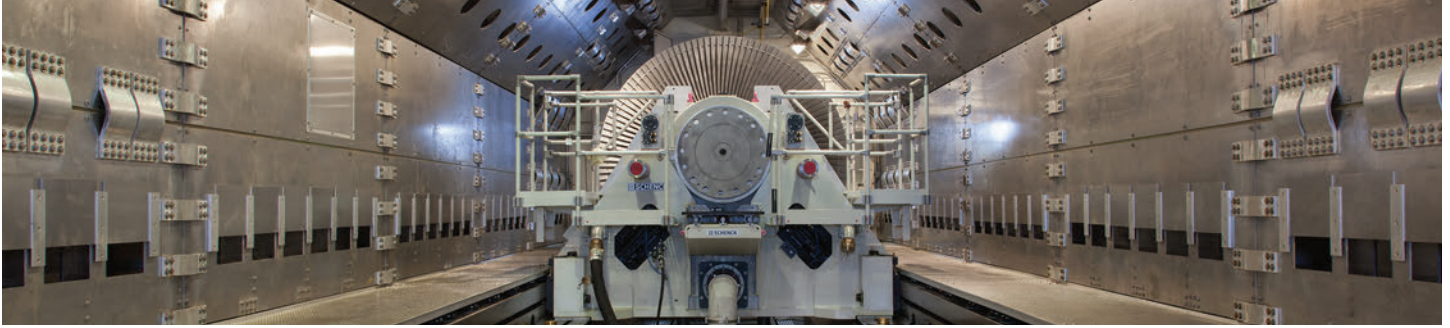
Proper balancing of gas turbine, steam turbine and generator rotors is extremely vital to ensure proper operation that allows the power generation industry to avoid millions of dollars in losses due to lost generation. Traditionally the maintenance of gas and steam turbine rotors has been done at low speeds, but this can fail to ensure effective operation once returned to high speed operation. Low speed balancing may fail to catch balance issues arising from repairs or replacement parts. For generator rotors some turn-to-turn shorts are only detectable at or near rated speed. Once returned to high speed operation, these faults not previously caught in low-speed testing, could cause vibrations leading to a damaging production shutdown.

MD&A's new high-speed balance facility allows for effective testing to ensure minimal vibrations in any manufacturer's rotor throughout testing. High-speed balancing has effectively shown to minimize any testing stresses during repairs, ensuring effective usage when returned to operation. Following a high speed balance at MD&A's facility, our experienced team of test engineers and technicians carefully review the results with the customer to establish that any unbalances have been corrected and will not affect the future performance of the rotor.



MECHANICAL DYNAMICS & ANALYSIS

For more information on High Speed Balancing Services please contact MD&A at 314-880-3000.



MD&A's High-Speed Balance Facility

MD&A repairs and balances gas turbine, steam turbine and generator rotors used to generate electric power. Turbine rotors, some as large as 13 feet in diameter and weighing up to 90 tons, require precision high-speed balance after repairs are completed and MD&A's new St. Louis facility will allow rotors to be rotated in a high-tech vacuum chamber at speeds up to 12,000 revolutions per minute. The 170,000 square foot building employs highly skilled engineers, machinists, technicians and support-personnel needed to maintain and repair these turbine rotors, generator rotors, and the components that allow them to function effectively.

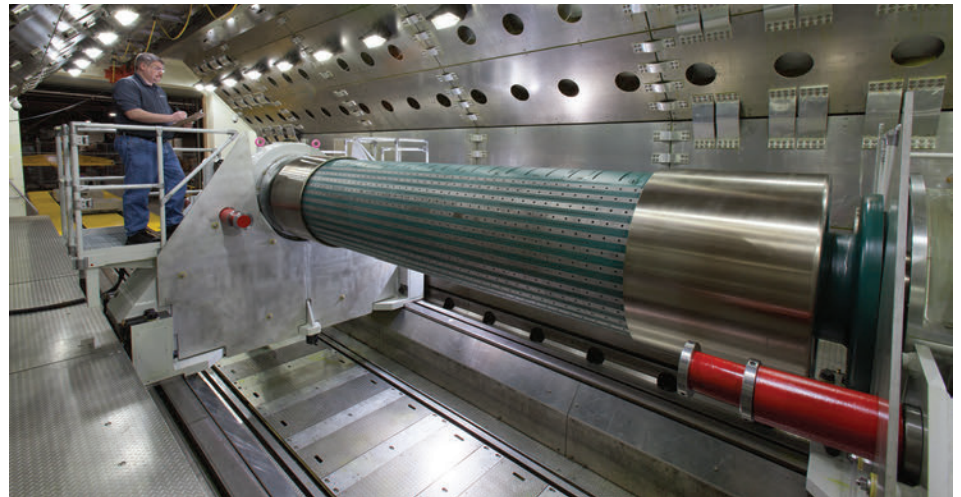
At the heart of the High-Speed Balance facility is the control room, with modern capabilities that allows the ability to control almost any system remotely. With four High Definition cameras mounted in the balance facility, MD&A's balance engineers can not only receive measurements digitally, but can also observe mechanical malfunctions real-time during operation.



Facility Accommodations

MD&A's facility can balance rotors up to 49 feet in length and up to 180,000 lbs. in weight at speeds up to 4,320 rpm, as well as, speeds up to 12,000 rpm for smaller rotors.

- 11,000 HP Drive System
- Schenck DH90 and DH-7 Pedestals
- Maximum Rotor Speed of 12,000 RPM
- Maximum Weight 180,000 lbs.
- Minimum Weight 1,300 lbs.
- Maximum Diameter 13'
- Maximum Length 49'
- Vacuum Capable for the High Speed Balance of Steam Turbine Rotors



Full High-Speed Thermal Test (HSTT) capability for electrically testing generator rotors at speed.

- Flux Probe
- Heat Run, HSTT
- Running Megger
- AC Impedance

For a Tour Video of the High Speed Balance Facility, visit our website!

MD&A TURBINE-GENERATOR REPAIR FACILITY

3804 Weber Road • St. Louis, MO 63125 • Ph: 314-880-3000 • Fax: 314-638-3473 • www.MDAturbines.com