



**Attention! Stop running around....Look at Turbomachinery
For Better care of your Rotating Equipments.**

Turbomachinery Engineering Industries Ltd., is a name synonymous for total power plant services in the country for last 20 years.....be it Spares & Services, Repairs & Retrofits, EPC contracts, O&M Contracts , Re Engineering and Relocation of Power Plants, both in India and abroad.

At Turbomachinery, we forge both expertise and innovation.

We are big enough to leadbut small enough to serve.

Rotary equipments like Turbines, Compressors, Pumps and Generators after long years of service, or storage are prone to one or more of

- Fall in thermodynamic Efficiency.
- Increase in Vibration and Acoustic Level.
- Change in Dynamic Behavior & stability.
- Rotor bends
- Surface and subsurface cracks
- Pittings
- Wear and tear
- Scoring marks on journals
- Radial & Axial Run outs.

Problems get compounded if we neglect them in the initial stage like our health.

As we face stress and strain in every day work, Rotary Equipments too are exposed to variety of stresses and cyclic loads day in and day out.

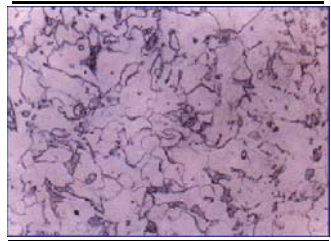
If your rotating equipments are in service for more than 10 years, here is a chance to give the Rotors a treat. We care for your Rotors like your family doctor.

Rejuvenation at Turbo machinery brings the Rotors back, to its specifications, **no matter, who built them originally.** Towards fulfilling the above, we at Turbomachinery undertake.....

1. DIAGNOSTIC TESTS:

To arrive at and to analyze the present Status of the equipment / Rotors and to recommend the appropriate remedial action to put back life into the Rotor, we at Turbomachinery, carryout variety of Non destructive tests and metallographic tests as per the international standards, to assess the present condition of the equipment and to recommend latest state of art technology for rejuvenating the equipment /Rotors.

- Liquid penetrant test.
- Magnetic particle test.
- PLC Based Ultrasonic test.
- In-situ Metallographic test.
- Hardness tests.



II. HIGH SPEED DYNAMIC BALANCING OF ROTORS :

We under take Dynamic Balancing of the Rotor in Vacuum Tunnel at Operating Speeds as per international standards API 612 and 617 ISO 5406 & 5303

Operating Speed Balancing will increase reliability of Rotors and enables precise measurement of the Rotor dynamics. Balancing at lower speeds can not offer the same accuracy as it cannot account for shaft deflections at operating speed.

Operating Speed Balancing facility depicts the actual operating conditions at site by using the actual Bearings, Exact lube oil system and other operating Parameters.

Over and above this over speed Trip Mechanism can also be tested and calibrated to avoid precious operating hours at site.

Operating speed Balancing of Rotor will prevent time consuming field Trials, especially on flexible Rotors.

At Turbomachinery we have executed Rated Speed Balancing for hundreds of Rotors of Turbines, Compressors, Pumps and Generators as per international standards. Rotor weight varying from 63 kgs. To 12500 kgs. Length varies from 450mm to 5500mm.



SPEC. OF BALANCING MACHINE

Max. Speed	: 18000RPM
Max. weight	: 15000 KG
Max.Job length	: 6000mm
Max.Job dia.	: 2500mm
Accuracy	: 0.2 gm.mm/Kg.

Balancing stands:
API 612,617
ISO 5406, 5343



In the past as this facility was not available everywhere most of the Rotors were balanced only at low speed. Because aging due to no. of years of operation, no. of shutdowns, cyclic loads, abnormal change in operation parameters and long storage, the Rotors soundness get affected. Hence we recommend **rated speed balancing of Rotors for healthy and reliable operation**

RELATED SERVICES:

- Hydro-jet /Aluminium Oxide cleaning to remove salts.
- Run-out measurement to check for Rotor bends.
- Demagnetizations to remove the induced magnetism.
- Polishing & Burnishing of Journals for smooth operation.

III. THERMAL STABILITY TEST :

Due to long storage or abnormal changes in operational parameters such as pressure and temperature or abnormal changes in startup or shutdown activities or due to sudden quenching of Rotors due to malfunctioning of drains, the Rotors can get bent.

This results in non- co-axiality of Geometric axis and Mass axis of the Rotor resulting in non uniform stresses and ultimate rejection of Rotors from operation.

Hence it is recommended to remove the bend by stress relieving operation so as to make the geometric and mass axis coaxial.



Before bend removal
(103mm bend)



After bend Removal

In our in house PLC based thermal stability test Facility, with online digital display for monitoring of Run-out measurement as per the latest technology, we undertake removal of bend in the Rotors by predetermined thermal cycles based on Material of construction and size of Rotor by heating, soaking and cooling till the uniform metallurgical transformation is achieved and there by the bend is brought down to the design values.

By this method, all the induced stresses are totally relieved and Mass axis and Geometric axis are made coaxial within limits.

This makes the rotors to operate at original specifications. We have undertaken no. of Rotor bend removals varying from 0.1 mm up to 104mm. and subsequently all the Rotors are in operation in excellent condition.



Towards fulfilling the customer's variety of requirements, we are glad to announce packaged services all at a cost, affordable at a fraction of cost of downtime.

Packaged services: To put back Rotors into Trouble free service, variety of refurbishment activities are to be taken up based on their historic problems.

Hence different packages are announced to suit different applications.

B. Rotor Health & Balance Check (RHBC)

- Activities belonging to
- Related Services.
 - Diagnostic tests.
 - Dynamic Balancing.

C. Rotor Bend & Balance Check (RBBC)

- Related Services.
- Diagnostic tests.
- Thermal stability test.
- Dynamic Balancing.

D. Rotor Master check (RMC)

- Related Services.
- Diagnostic test.
- Thermal stability test.
- Dynamic Balancing.

Select or give us a chance to select a Right Package to your Rotating equipments.

At Turbomachinery, your Rotor/ Equipment is in safe & secure hands

Turbomachinery Engineering Industries Ltd., outperforms the rest in the field where efficiency, productivity, dependability and cost effectiveness is the name of the game.

We invite you to share our experience and knowledge.....

For further details contact : **Turbomachinery Engineering Industries Ltd.,**
 309, IDA, Bachupally, Miyapur – Bollaram Road,
 Hyderabad – 500072
 Ph: + 91 40 23042552/23040427; Fax : 040 - 23043974