





At alfanar Technical Services (ATS), our Mission is to sustain our prominence as the provider of high-quality, precision-engineered repair and rewind services for all types of medium and high voltage static and rotating equipment like Transformers, Motors and Generators. ATS also manufactures Magnet Wires, Insulated Conductors and Preformed Coils for various electrical applications including medium and high voltage electrical equipments.

The use of modern technology in our factory at Jubail, Saudi Arabia, and the years of practical experience has enabled us to offer a wide array of engineering, technical services and logistical resources catering to the needs of our customers in the power, petrochemical and manufacturing sectors in the middle east region.

Our unique edge is in our conformance to international standards on quality by extending an as-new warranty for the repair works done at ATS.

alfanar Technical Services is a specialised unit of alfanar Engineering Services that provides solutions in testing & commissioning, steel fabrication, operation and maintenance, equipment calibration and technical training institute.

ATS facility in Jubail is one of the most modern and equipped state of art infrastructure to repair the mechanical damage on the motor parts

MOTOR 360° SERVICES

- Overhauling & Rewinding of LV and HV AC as well as DC complete Motors
- Trouble shooting of Motors
- Refurbishment of shaft for the rotors
- Perform No load test up to 27000Hp Motor of any type
- Manufacture preformed coils and supply up to 27000Hp, 13.8Kv
- Perform Dynamic Balancing up to 32 Ton rotors
- Re babitting of sleeve bearings up to 600 Dia.

- Supply Electric Motors including site survey and reverse engineering
- Supply of High Voltage Preformed coils
- Supply of rewinding Kit
- Supply of Online partial discharge monitoring devices
- Supply of motor spare parts of various OEM
- Supply of motor special components



- Dismantling and Overhauling at site for complete motor
- Dry Ice cleaning at site
- Rigging activities to remove where there is no crane access
- Alignment of motor with respective loads
- Turn around maintenance shutdown projects for electrical rotating machines

- Online Partial Discharge measurement, Analysis and correction
- RCA / Failure Analysis of the motor
- Solving High Vibration Problem for any type of motor
- Providing Welding solution for special maintenance & repair jobs
- Redesigning High Voltage coils to based on RCA analysis to avoid future failure
- Life assessment of Electrical rotating machines



Large electrical rotating machines by their very nature are critical to any company's operation and, in addition, represent a substantial capital investment.

We at ATS understand the importance of these machines to its customers and provide well-equipped facilities with highly qualified and skilled technical team, for motor rewinds, repairs and overhauling of rotating equipment up to 27000HP.

We offer a complete range of services for AC and DC motors including AC & DC traction motors. At ATS, we combine cutting-edge technology with the ability to rebuild every kind of traction motor.



The combination of its expertise and comprehensive facilities enables the Motors Division at ATS to handle all aspects of a repair including on-site as well as in the workshop, whilst meeting tight delivery deadlines, cost criteria and quality.

Furthermore, we provide a 24/7 assistance to our privileged customers for any crucial and emergency requirements for silo related services.

ATS manufactures all kinds of coils like diamond shape, concentric and Rotor Pole coils up 27,000HP ratings.



ATS is the only facility in Mena & Asia to be approved by Aramco for repairing 27000 HP motors.

1



ATS becomes the only company in Saudi Arabia certified to repair Flame Proof Motors

2



ATS's facility in Jubail is one of the most modern and equipped state of art infrastructure to repair the mechanical damage on the motor parts.

3

OVERHAULING & REPAIR SERVICES



1. Rewinding, Repairing and Overhauling of:
 - a. MV and HV AC Induction motors includes squirrel cage, slip ring, synchronous induction motors
 - b. AC & DC motors
 - c. DC motors including traction, field coils and armatures
 - d. AC Traction Motors.
 - e. Lifting magnets.
 - f. Traction Blower Fans rewinding and blade replacement.
 - g. High voltage submersible pumps motors.
1. Replacement old / bend / damaged shaft with new forged shaft or of identical material.
2. Repairs to worn-out rotor shafts and bearing housings by selective plating as well as weld repair using special welding rod.
3. Re-babbiting of white metal Sleeve and Pad bearings
4. Re-staggering of stator and rotor core.
5. Replacement of stator and rotor laminations with identical or upgraded material.
6. Re-caging of rotor with new EC grade rotor copper bars and new end rings.
7. Inspection and Replacement of retaining rings of rotors with correct material.
8. Supply and installation of commutators for DC armatures.
9. Supply and Installation of new slip-rings.
10. Supply of carbon brushes and brush holder assemblies.
11. Supply of all types of rewinding kits including magnetic wedges.
12. Dynamic balancing as per ISO grade 2.5.
13. Vibration analysis using latest techniques for motors at site and in house.
14. Repair of Partial discharge occurring in the winding due to surface insulation deterioration.
15. Repair of loose magnetic wedges either by replacement or reinforcement with H class high strength epoxy resins and hardener.
16. Perform Vacuum Pressure Impregnation process of large high voltage machines using latest resin which has high thermal stability & high dielectric strength with Online Capacitance Monitoring Systems.



SITE SERVICES

1. Installation and Commissioning of old and new motors.
2. Alignment services using latest technology Laser alignment equipment.
3. Replacement of spare motor during abnormality in the existing machines.
4. Rigging services where there is no direct access or availability of cranes for installation of motors.
5. Sleeve bearing inspection on site during shutdown.
6. Vibration analysis using latest technology equipment like CSI 2140, OROS, etc.
7. Installation of online monitoring of Partial Discharge equipment.
8. Onsite measurement of Partial measurement, thermography, trouble shooting.
9. Overhauling at site.
10. On site balancing.
11. Dry Ice cleaning of motors at site

Below picture for handling sites where there is no direct access to crane. Motor is removed using jacking & sliding method safely and without any safety concerns.



TEST FACILITY

We have one of the most advanced and sophisticated testing facilities in the Middle East region for Motors. Our highly experienced Engineers and skilled technicians successfully contribute in diagnosing the electrical and mechanical fault in the motors.

Motors are tested at no load as per IEC 60034 standards and vibration values are maintained as per IEC 600816 standards. The test plant is capable to test the motors up to 20MW on no load from 1.1KV to 13.8Kv range of motors.

All the motors under service undergoes crucial incoming inspection for mechanical and electrical test and result analysis.

Availability of in house high end testing equipment's makes easy assessment of the motors for even small defect in the motor winding.

Following are the test capabilities available in house and site for electrical offline test for the motors

1. IR,DAR&PI test
2. Dielectric Discharge test
3. Winding circuit analysis
4. Step voltage test
5. AC/DC high voltage test
6. Polarization and depolarization current analysis
7. Nonlinear behavior of stator winding insulation system
8. Corona probe
9. Contact resistance
10. Rotor bar growler test
11. winding ohmic resistance
12. High frequency Surge Comparison Test as per IEE 522
13. Offline Partial Discharge Test
14. Tan Delta& capacitance Test

15. ELCID test
16. Full flux Core loss & HOT spot test
17. RSO test for round wound rotor windings
18. Pole balance test
19. Wedge tightness test
20. Dark Room Test
21. Bore scope visual inspection
22. Conformity Test /inspection of Motor's protection components like surge arrester and surge capacitor and CT
23. Conformity Test /inspection of Motor's accessories like temperature sensors, space heaters ,level switches protection and rotating semi conductive components

Following can be done dynamic testing of the motor

1. No load test up to 27000HP rated all types of Motor viz, Slipring, Squirrel cage ,DC motors as well as Synchronous motors with voltage range up to 13.8KV
2. High Current and High Capacity Synchronous machines no load function test using belt drive method
3. On line Balancing for the motors.
4. Shaft electrical run out measurement
5. Shaft vibration measurement Using Bentley Nevada and Meggit
6. Casing vibration measurement and analysis by using Highly advanced instruments
7. Online Partial Discharge test
8. Acoustic emission analysis for rolling element bearings
9. Online Ozone measurements of rotating electrical motors
10. Online motor current signature analysis



REPAIR FACILITY-SELECTIVE PLATING

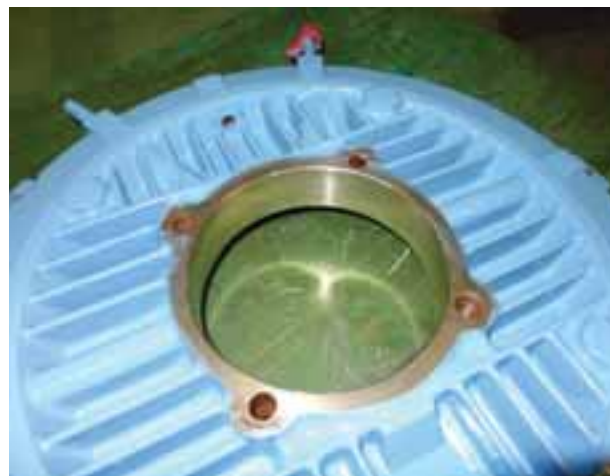
Fastest Way to Repair the Shaft and Bearing Housing with Quality Standards

The facility is capable of providing brush/selective plating for the motor shafts as well as bearing housing. This type of reconditioning uses electrical current to plate a desired material from a solution and bond a conductive object with a thin layer of the material, such as Carbon steel and cast iron or Aluminum. alfanar Technical Services understands that electrical/mechanical equipment repair is a critical part of your business's operation. The equipment's related downtime can idle production lines, reduce productivity and throw schedules into disarray. With so much at stake, your equipment has to be provided with quality repair and outstanding customer service. That's why when it comes to mechanical/electrical equipment repairs; industries throughout region choose alfanar Technical Services.

Proper shaft reconditioning can improve performance while extending the life of your rotating equipment by many years. After disassembly, shafts undergo straightness, sensitive dimension and balance checks as part of our intensive analysis. Our experienced technicians recondition your shaft to like-new condition including Selective Plating.

Selective Plating

Selective Plating is a process which uses electrical current to plate a desired material from a solution and bond a conductive object with a thin layer of the material, such as Carbon Steel and Cast Iron or Aluminum. Electroplating is primarily used for depositing a layer of material to bestow a desired property (e.g., abrasion and wear resistance, corrosion protection, aesthetic qualities, etc.) to a surface that otherwise lacks that property. Another application uses electroplating to build up thickness on undersized parts, from excessive machining or damage, etc. Selective Plating allows localized areas or entire items to be plated using a brush arm with plating solution.



SELECTIVE PLATING

Fastest Way to Repair the Shaft and Bearing Housing with Quality Standards

Advantages over Tank Plating

Selective Plating has several advantages over tank plating, including portability, ability to plate items that for some reason cannot be tank plated such as items too large for tank plating and items that cannot be removed or dispatched to a tank, low or no masking requirements, and comparatively low plating solution volume requirements. The bond strength in selective plating is over double that of tank plating, where tank plating has 6,000 pounds of bond strength per square inch, selective plating has 14,000 pounds per square inch. Selective Plating also allows a precise amount of material to be applied to a specific area desired; tank plating does not allow that luxury.

Plating Solutions

alfanar can offer 70 different solutions for cleaning, activating, bonding and metal-build-up solutions. Nickel, Chrome, Cobalt, Copper, Tin, Zinc, Babbitt, Cadmium, Gold and Silver and alloys just to mention a few.

As per current requirement in Motor Repair and service Industry, following are the main solutions preferred:

- 1) Nickel for Shaft and Bearing journals
- 2) Copper for Bearing Housing and heavy dents marks on the shaft bearing or seal journal
- 3) Babbitt for fine coating of Babbitt bearings refurbishments



ADVANTAGES OF SELECTIVE PLATING

- Cold process and has no thermal distortion on the base metal
- Plate to desired tolerance with precise calculation
- Many (70) different metals to choose, for diff. applications
- Excellent bonding strength allows grinding, machining, etc.
- Dense deposits, good for corrosion resistance
- Fast built up capacity as compared with tank plating
- Electroplating can be done, on all conductive surfaces
- Portable equipment makes it possible to repair onsite

MAJOR ACHIEVEMENTS



25,000HP, 13.8KV motor stator



Overhaul & repair excitation system of 25000HP, 13.2KV, 1800RPM motor



Rewinding of 11,000HP cylindrical synchronous rotor for Saudi Aramco



Rewinding of 16000HP Stator for Saudi Aramco



Rehabilitation of 1800HP, 4KV, 6pole Induction motor for Marafiq Yanbu



Manufacturing / Repair of slip rings for 9500KW / 11500KW ratings of Motor

REPAIR FACILITY- REBABBITTING OF BEARINGS

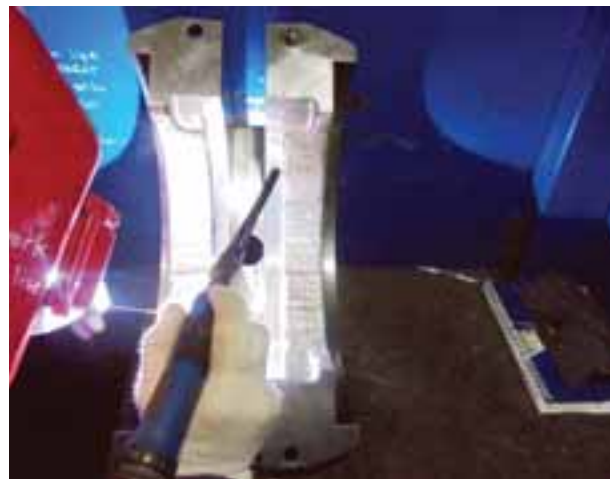
As a backward integration ATS felt extreme necessary to have rebabbitting facility in-house to meet customer emergencies during major overhaul or repair of small medium and large machines by initiating new process of removal of old babbitt and replacing it with new and machining to required sizes.

ATS uses procedure that covers re-babbitting of white metal Bearings with TIG and Oxyacetylene Puddle method using ASTM B23 Grade 2, Babbitt wire. The quality of wire is so high that there are negligible chances of pinholes that may occur while performing the process.

The Babbitt wire is purchased from highly renowned OEM of this metal to have no dilution in the quality of the product as well controlling the cost of the process.

The welding machine is of high quality with precise control of current to be set based on the quality of product required by this process depending upon type of bearings.

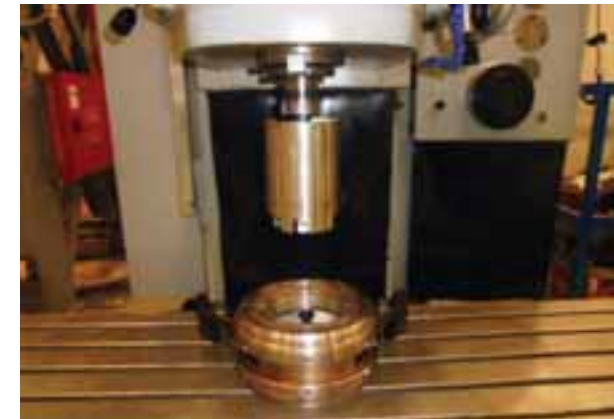
Below are some pictures during the process and finished product.



In process Welding of bearing



Bearings after welding process completed



Bearing under machining



Bearing under rough machining



Dimensional check of bearing after machining



NDT test of Bearing



During NDT Test- No Pin Holes

THE ROAD TO FUTURE

Training Facility

Intermediate Level - Motor Maintenance and Trouble shooting

Course Goal

Upon completion of this course the participants should be able to:

- i. Comprehend the theoretical basics of the Motors.
- ii. Maintain & Troubleshoot of Motors.

Course Topics

1. Construction of Motors.
2. Types of Motor & its significance.
3. Basic Alignment theory & practical.
4. Preventive Maintenance of Induction Motors.
5. Basic Trouble Shooting of Motors.
6. Electrical Testing of Motors.
7. Basic knowledge & Significance of Explosion proof Motors.
8. Bearing types & installation with care.
9. Partial Discharge on High Voltage Motors.
10. Root cause analysis

