CORE CONCEPT

Electric Motor Repair and Rewinding Course: Core Loss Testing, VPI and Repair Shop Quality

Electric Motor Repair and Rewinding Course: Core Loss Testing, VPI and Repair Shop Quality

Introduction:

Electric motor repair and rewinding, with core loss testing, VPI and repair shop quality, is a 1-week course for motor service shop, winding bay and reliability teams that ends with a Motor Repair Shop Quality and Process Plan for a case organisation. Organisations lose energy, uptime and money when rewound motors come back with hotter cores, shorter insulation life, poor balance and no usable repair records. Nominees already supervise, perform or buy motor rewinds and learn through inspection walkthroughs of stripped stators, rotors, test records and shop routings. CoreConcept Training Center delivers this motor rewinding course.

Course Objectives:

- Run incoming inspection, as-found testing and teardown records that establish why each motor failed before any rewind decision
- Capture original winding data, coil geometry and slot details so the rewound stator matches or improves the original design
- Apply core loss testing before and after stripping, controlled burnout temperatures and surge testing to protect stator core and winding quality
- Supervise coil winding, insertion, connection, VPI varnish treatment and curing to EASA AR100 good practice
- Specify bearing fits, shaft and housing repair, dynamic balancing and final no-load run tests against IEC 60034 limits
- Decide repair, rewind or replace with lifecycle cost and run an in-house or contract motor repair shop through scope, audit and turnaround measures

Target Audience:

- Teams responsible for managing in-house electric motor repair and rewind shops
- Winding bay and test bay supervisors responsible for coil production, varnish treatment and final testing
- Reliability and rotating equipment teams responsible for sending motors out for repair and accepting them back
- Maintenance planning teams responsible for motor spares, repair scopes and repair-or-replace decisions
- Contract and supplier quality teams responsible for qualifying and auditing external motor service centres

Course Outline:

Day 1: Motor Repair Shop Context, Failure Modes and Incoming Inspection

- Motor Service Shop Workflow From Receipt to Dispatch
- Stator Winding, Rotor and Bearing Failure Pattern Recognition
- Incoming Inspection Checklist and As-Found Condition Photographs
- As-Found Electrical Tests Before Teardown and Dismantling
- Current-State Shop Assessment Using Repair Turnaround Records

Day 2: EASA AR100 and IEC 60034 Repair Practice, Winding Data and Core Testing

- EASA AR100 Record Keeping, Tests and Repair Guidelines
- IEC 60034 Ratings, Temperature Rise and Efficiency Expectations
- Original Winding Data Capture Sheet and Coil Pitch Recording
- Core Loss Tester Readings Before and After Stripping
- Controlled Burnout Oven Temperature Limits for Stator Cores

Day 3: Rewinding, VPI Varnish Treatment and Mechanical Repair

- Magnet Wire Selection, Coil Winding and Slot Insulation
- Coil Insertion, Phase Separation, Lacing and Connection Brazing
- Vacuum Pressure Impregnation Cycle, Resin Control and Oven Curing
- Bearing Fit Measurement, Housing Repair and Shaft Journal Restoration
- Rotor Cage Inspection and Dynamic Balancing Machine Correction

Day 4: Final Testing, Efficiency Retention and Repair Economics

- Surge Test, Hipot and Winding Resistance Acceptance Limits
- No-Load Run Test, Vibration Level and Bearing Temperature
- Efficiency Retention Factors Across Copper, Core and Friction Losses
- Repair Versus Replace Lifecycle Cost and Energy Payback Comparison
- Repeat Rewind Failures, Root Cause and Corrective Action Log

Day 5: Inspection Walkthrough and the Motor Repair Shop Quality Plan

- Case Motor Walkthrough Against Incoming Inspection Checklist
- Case Repair File Review for Core Loss and Surge Data
- Contract Motor Repair Scope of Work and Shop Audit Checklist
- Repair Report Template, Shop KPIs and Turnaround Targets
- Motor Repair Shop Quality and Process Plan Completion

Skills You Will Gain:

- Failure Mode Recognition
- Winding Data Documentation
- Stator Core Loss Assessment
- Varnish Treatment Control
- Dynamic Balancing Practice
- Repair Acceptance Testing
- Rewind Economics Analysis
- Motor Service Vendor Auditing

Why Attend This Course:

- Deliver a Motor Repair Shop Quality and Process Plan for a case organisation to the maintenance manager and the reliability lead
- Judge whether a failed motor should be repaired, rewound or replaced using test data, lifecycle cost and lead time
- Avoid hotter rewound cores, early insulation failure and repeat bearing damage caused by uncontrolled burnout, poor varnish cycles and weak fits
- Pass winding data sheets, core loss records, final test forms and vendor audit checklists to winders, test technicians and buyers

Conclusion:

Back at work, the participant hands the maintenance manager, reliability lead and purchasing team a Motor Repair Shop Quality and Process Plan covering incoming inspection, winding data, core loss limits, VPI cycles, mechanical repair checks, final test acceptance and contract shop audit criteria. Management uses it to decide which motors to repair in-house, which to send out and which to replace. After the first ten motors pass through the plan, the team should review core loss changes, final test results, turnaround and repeat failures and tighten limits where results drift.

Frequently Asked Questions FAQ:

What should participants know before an electric motor repair and rewinding course?

Participants should already supervise, carry out, inspect or buy motor repairs and be able to read a motor nameplate and basic test readings. Bringing anonymised repair reports, winding data sheets or core loss records helps apply the walkthroughs to their own shop.

How does an electric motor repair and rewinding course differ from a motor and drive troubleshooting course?

It covers the repair shop itself: teardown, winding data, core testing, rewinding, varnish treatment, mechanical repair, balancing and final acceptance. Troubleshooting courses focus on motors in service, starters, drives and protection settings, which this course does not address.

Why does core loss testing matter in electric motor repair and rewinding?

Core loss testing shows whether stripping and burnout damaged the stator laminations. A damaged core runs hotter and wastes energy after rewind, so testing before and after stripping tells the shop whether the core can be reused or needs repair.

What do participants take back from the electric motor repair and rewinding course?

Participants take back a Motor Repair Shop Quality and Process Plan for a case organisation, with an incoming inspection checklist, winding data sheet, core loss record, final test form and contract shop audit checklist to adapt to their own motors.