

CASE STUDY OF RECTIFICATION OF DOUBLE CAGE ROTOR OF BOILER FEED PUMP MOTOR

Executive Summary:

If repairers do not take their job seriously and execute the repair work with lack of knowledge, it leads to catastrophe. The author in this paper brings out the case of malfunction of a repaired double cage rotor of Boiler feed pump motor having rating 1850HP, 3000V.

Introduction:

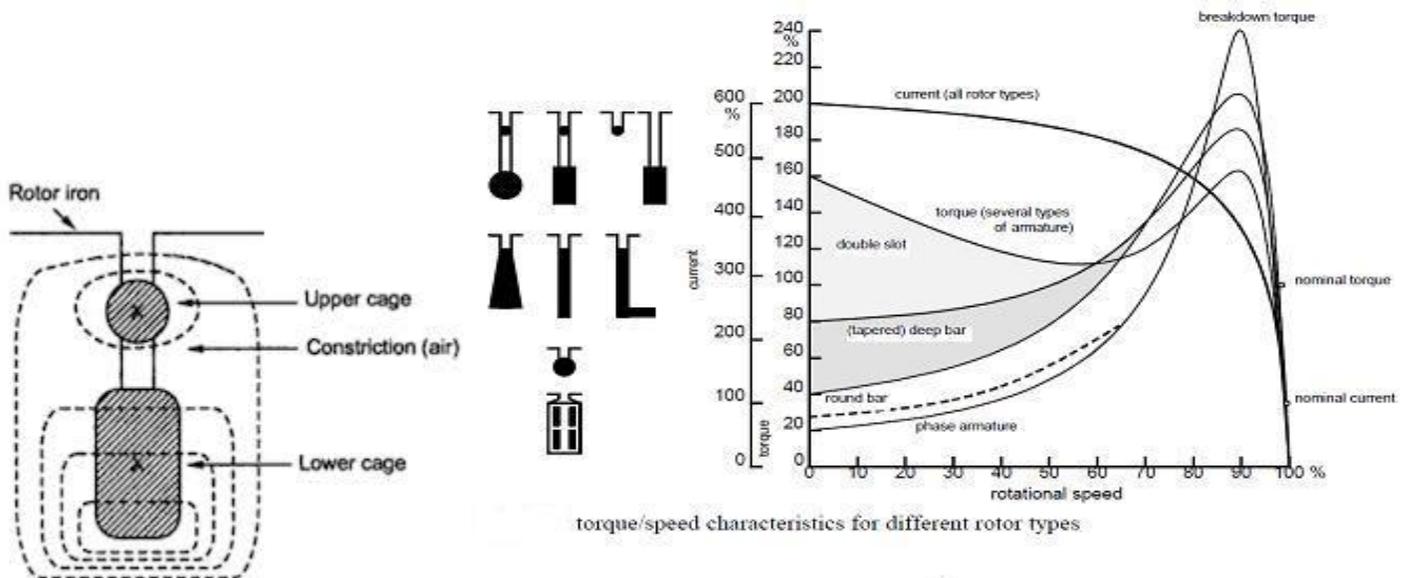
In any thermal power plant the biggest motor is the Boiler feed pump motor. This case study involves the malfunction of spare rotor of the BFP motor at the plant which was generating 62.5MW. TEC, Trombay Thermal Station A (now TPC). The rotor was repaired at Lenzohm works, Deonar Mumbai (now taken over by ABB). Lamination were replaced & the rotor bars were re soldered to the end rings.

Malfunction in Brief:

Whenever the motor with the repaired rotor was started, there was a peculiar style of vibration noticed in the pedestal bearing of the motor. Sometimes the vibration were within limits of 30 micron, & sometimes it used to touch 300microns. All known efforts to analyse this behavior and rectify the defect failed which also included replacement of sleeve bearings of the motor.

Functioning of Double cage rotor:

Double cage rotor is used when the motor has to start at full load. At the time of starting the motor requires high resistance & low reactance in the rotor circuit. The thick rotor bars present in the outer periphery & connected to the outer ring helps to achieve this. When the motor picks up speed, the need is for low resistance & high reactance in the rotor circuit. The inner cage having copper flats embedded deep in the lamination & connected to the inner ring provides this requirement and the motor runs at its rated speed. The sketch provided below gives an example of the positioning the rotor bars.



Need for Rectification, and Repairs:

As seen above the vibrations were un predictable, and as there were no other spare rotor, the author decided to investigate further by executing re repairs to the rotor. The rotor was sent to Pune at TEC IN house works for investigating & repairs. After dismantling the outer cage including the rings & bars, it was noticed that soldered materials were sticking to the inner cage. These soldered material were virtually shorting the outer cage & the inner cage, as a result of which there were unpredictable vibrations in the rotor. Re work were executed by removing all foreign materials. The inner cage were soldered properly. Then outer cage were fixed in position. Efforts were made to see that the outer cage had a spacing of 5mm with respect to the inner cage. After repairs the rotor was put back in service & to the surprise of every one the vibration level was steady at 20 micron (limit being 30 micron).

Conclusion:

The above incident clearly shows that if repairs are carried out by persons having lack of knowledge on the equipment and its working principles, then one lands into a bigger mess.

By

A.V.Prasanna