

PRESENTATION ON DEEP BAR & DOUBLE CAGE ROTORS

1

CONTENTS

- ▶ Need for Deep-Bar and Double-Cage rotor
- ▶ Deep-Bar rotors
- ▶ Torque-Slip relationship
- ▶ Double-Cage rotors
- ▶ Equivalent circuit diagram
- ▶ Applications
- ▶ Conclusion

2

What is the need?

- ▶ Conventional Squirrel Cage motors suffer from the disadvantages of low starting torque because of low rotor resistance.
- ▶ The starting torque can be increased by using the bar material of higher resistivity.
- ▶ However high rotor resistance reduces the full-load speed, increases rotor ohmic loss and lower efficiency.
- ▶ Therefore in order to achieve high starting torque without effecting the efficiency, the rotor resistance is made higher at the time of starting & low under normal operating conditions.

3

- ▶ In wound rotor induction motors these conditions are met by connecting external resistance in rotor circuit at the time of starting & resistances are cut out in steps as the motor attains its normal speed.

- ▶ In squirrel cage motor this is not feasible as the conductors are short-circuited by end rings. In order to attain the above desired conditions following types of rotors are used:-
 - Deep bar rotor.
 - Double cage rotor.

4

Deep-Bar Rotor

- ▶ Figure below shows a cage rotor with deep and narrow bars. A bar may be assumed to be made up of number of narrow layers connected in parallel.
- ▶ It is seen that the top most layer element 'A' is linked with minimum leakage flux and therefore its leakage inductance is minimum.
- ▶ On the other hand, the bottom layer 'C' links maximum flux, therefore its leakage inductance is maximum.

