Synchronous Motor and Controller Maintenance

**Duration:** 60 mins  |  **Level:** Intermediate  |  **Pass mark:** 80%

**Course Description:**
Synchronous Motor Maintenance Power factor correction; Constant Speed under varying load; High efficiency; High torque at low speeds; Low Maintenance; Performance stability and Compatibility with Variable Speed Drives are among the many reasons for the popularity of Synchronous Motor Applications throughout industry. Like all manufactured products, however, Synchronous motor systems must be monitored and maintained or the performance benefits will diminish or disappear. This lesson focuses on the routine maintenance requirements for Synchronous motors and their controllers.

**Learning Objectives:**
- Define synchronous speed
- Explain how amortisseur bars can be used to bring a synchronous motor up to synchronous speed
- Describe how the rotor of a synchronous motor locks in with the stator’s rotating magnetic field
- Describe the effect of load on a synchronous motor
- Describe the effect of varying the rotor’s electro-magnetic field
- Define power factor
- Explain how power factor adjustment of a synchronous motor can improve the overall electrical efficiency of an industrial operation
- Define field control
- Describe three problems associated with field control
- Identify magnetic field controllers and state their main function
- State the function of a field frequency relay in a magnetic field controller and describe its operation
- State the function of a field loss relay in a magnetic field controller and describe its operation
- List the items to be inspected on an operating synchronous motor
- Describe or demonstrate how to test a synchronous motor to verify that it is de-energized
- List the items to be inspected on a synchronous motor that is not operating
• Describe or demonstrate an insulation test on both a rotor and a stator of a synchronous motor

• Describe or demonstrate how to test a synchronous motor controller to verify that it is completely de-energized

• List the items to inspect on a synchronous motor controller

• Describe or demonstrate how to test a de-energized controller for grounds

• Describe or demonstrate how to test a de-energized controller for opens and shorts

• Describe or demonstrate how to test both the rotor and the stator of a synchronous motor for grounds

• Describe or demonstrate how to test both the rotor and the stator of a synchronous motor for opens and shorts