

Chapter 3: Commissioning (5 hrs)

→ Tests required before commissioning of electric machine

- a) Mechanical fixture and alignment.
- b) Electrical tests
- c) Critical precautions for starting or charging.

→ Commissioning test :-

These tests are carried out after the satisfactory completion of equipment test. The commissioning test are held for part of machine, or for checking the machine process and facilities to verify that it functions in accordance with the design intended. The complete process of commissioning can be summarised as checking the machine operation for maximum output as intended and as the demand laid. It is divided into four stages namely; pre-design, design, construction and operation.

→ Different commissioning tests :-

↳ Mechanical fixture and alignment :-

1. Checking the nameplate data against the specifications laid.
2. Observing the machine for its complete package and also checking that no part of it is missing or broken during transportation.
3. Checking the brushes and brush holder for proper tension on it to make connection with slip ring and commutator.
4. Checking for proper winding ends, slots and wire bands.
5. Checking the tightness of nuts and bolts.

6. If machine is coupled with other equipments then alignment of shaft coupling must be checked.
7. Proper greasing and oiling is checked.
8. Checking for bearing noise.
9. Checking clearance between stator and rotor.
10. While moving the rotor it is checked that scratching doesn't take place.
11. Terminals are checked for tight connections.
12. Position of brush and brush holders are checked.

ii) Electrical Test :-

1. Checking winding resistance.
2. Checking insulation resistance.
3. High voltage test must be carried out.
4. Starting the machine with a low or reduced voltage source.
5. Testing the machine at no load condition.
6. Testing the machine at full load condition.
7. Testing the insulation and also insulation oil.
8. Testing the earth resistance.
9. Inspection of hot contacts with infrared rays.
10. Checking all current carrying path, controlling

the auxiliary system and materials.

iii) Initial Precautions for starting or charging:

1. **Electrical Commissioning test** :- Testing of all equipments, sub-system, related plants, etc to confirm satisfactory performance.
2. **Electrical Maintenance test** :- Testing of all abnormal operating conditions, short circuit cond., unbalanced supply, voltage hikes, etc. Also tests are done to check vibrations, temperature, dust, moisture, fumes, stress, etc.
3. **Routine Tests** :- These tests are carried out before dispatch from manufacturer's end to confirm the quality and proper functioning.
4. **Energizing tests** :- These tests are required to energize the equipment or machine by connecting it to supply line after verification of proper voltage, frequency, polarity, phase sequence, etc.
5. **Research and Investigative tests** :- These tests are conducted to identify, verify and analyze the working phenomenon of the machine and also to determine its reliability and cause of defect or failure if any.