



3 MONTHS MAINTENANCE REFRESHER COURSE-SYLLABUS

FIRST WEEK- 48hrs.

➤ Simulator training.

➤ **Complete power plant cycle explanation:**

Explain about boiler ,Turbine, Generator ,excitation & Transformer, firing system in boilers Transformers switch yard - Means that students should understand fully how the power is produced and how the power transmission is done and finally distributed to the customers.

➤ **Identification of all equipments and locations search:**

Students should be familiar with the equipments name of the power plants and kks number and the location.

➤ **Working principle of each equipment in brief:**

Examination .

Second week- 48hrs.

- Boilers –working principle of firing system.
- Fuel oil and /coal handling system.
- Water circulation in boilers and principle.
- Steam circulation inside boilers importance of super heat.
- Explain drum internals-explain the importance of each component inside the drum.
- Flue gas path explanation-SH, APH, ECONIMISER-explain working principle and construction.
- Feed water systems.
- Boiler protections and instrumentation.
- Welding procedures TIG and ARC welding practical training-one day practical.

Examination

Third week- 48hrs.

- Introduction to turbine.
- Working principle.
- Components of turbine.
- Turbine construction details.
- Bearings and maintenance.

Examinations

Fourth week- 48hrs.

- Turbine auxiliaries.
- Explain about lub oil system.
- Explained about global coolers.
- Isolation procedures.
- Coolers maintenance.
- Explain about ejectors.
- Main ejector and hogging ejector.
- Internal construction of ejectors.
- Importance of vacuum system in condenser.
- Condenser cooling system.
- Explain inside construction of condenser.
- Explain condenser tube cleaning system.
- Explained about condensate extraction pump.
- Explain about gland steam condensers.
- Explain about vacuum pumps.



Examinations

5th week- 48hrs.

Tube cleaning and acid cleaning of condensers
Maintenance of ejector condensers
Maintenance of ejectors
Maintenance of fans
Important tools required for turbine maintenance
Turbine casing lifting procedures
Turbine protections

Examinations

6th week- 48hrs.

- Generator-internal construction-principle of power generation.
- Importance of exciter, different types of excitation.
- Automatic voltage regulation generator cooling systems.
- Name plate reading of different electrical components.
- Rotor construction.
- Generator protections.
- Use of working procedure on electrical apparatus.
- Tools required for generator maintenance.
- Practical use of mega and other electrical meters.
- Tell the students to practically use the multi-meter and megger.
- Importance of earthing system in electrical appliances
- Safety gears required before working in electrical apparatus.
- Types of earthing available.

Examinations

7th week- 48hrs.

- Explain the construction and principle of working of Transformers.
- Explain the internal construction and all the components of Transformers.
- Tell the students to draw the transformer and Margie name of each component.
- Explained the transformer regulation.
- Expand the on load tap changes and off load tap changes.
- Explain transformer cooling systems students should be familiar with name plate reading of Transformers.
- Explain protections and interlocks of Transformers.
- Explain the different tests required to Commission the transformer.
- Explain isolation and isolation of Transformers.
- Explain transformer oil circulation hand periodical checks.
- Explain different types of Breakers.
- Explain in detail about South of 6 Breakers.
- Show them practically how to operate the Breakers.
- Explain the step up transformer and how the power being transmitted from the power station to the consumers.
- Explain the ups system.
- Explain killed about battery maintenance hunt different types of batteries.
- Explain the emergency diesel generator hand lighting system.
- Explain the electrical busbar systems and method to isolate.
- Explained very clearly about safe working of electrical system.
- On earthing system in the power station.

Examinations

8 week- 48hrs.

- Explain about Deaerator.
- Working principle internal construction.
- Explain about makeup water system.
- Briefly explain about RO systems and how makeup water being produced.
- Explain about axillary stream system, soot blowing, ejector steam, trace heating.
- Roughly explain about chemical dosing in Deaerator and in boilers.
- Explain how to take readings.
- Cleaning of directors.
- Explain hydro testing.
- Explain about NDT techniques.



Examinations

9th week- 48hrs.

- Expand simple cycle.
- Explain air path of the gas turbine.
- Explain gas path of gas turbine.
- Explain the combustor.
- Explain compressors on turbine.
- Explain about air intake filter add changing procedures.
- Explain pulse cleaning system.
- Compressor washing procedures.
- Explain the tools with the help of YouTube and clearly explained how to use the tools.
- Students should be very familiar with the tools name for the turbine major overhaul.
- Explain the gas turbine internal. And if possible plate changing procedures.
- Sand blasting techniques.
- Chimney maintenance.
- Cleaning of HRG path.
- Handling of sulphur inside the boiler.
- Explain the HRSG duct firing system.

Examinations

10th week- 48hrs.

- Practical training-Maintenance of all types of walls.
- Practical training in maintenance of pumps.
- Practical training in maintenance of heat exchangers
- Explaining pig cleaning of the pipes.
- Different types of supports in pipelines.



Examinations

11th week- 48hrs.

- Explain different types of filters and coolers available in the power plant.
- Explain clearly the isolation procedure for the filters.
- Explain gas station.
- Cartridge filters/bath heaters.
- Expand clear maintenance procedure for different types of filters.
- Explain gas station safety.
- Expand clearly confined space and how to use the safety meters.
- Explain hot work system.

Examination.

12th week-48HRS.

- Must be very familiar with HSBC passport
- Plant entry procedures.
- Importance of punctuality Explain use of radios
- Explain clearly use of PPE.
- Plant Fire Systems fire safety.
- Different type of fire exclusive items and Explain clearly how to use it.
- Explain in case of fire emergency. Use of breathing apparatus fire assembly point.
- Explain about different permit system.
- HSC rules and regulations, has in the safety passport.
- All students Work behavior with the client.
- Psychological problems when working in abroad hand method to cope of the realities.

Final examination.