Chemical Cleaning of Thermal Power Stations

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Objectives and other details of modules

Duration – 75 minutes

Training aids

Power point Presentations

Objective

At the end of the session participants will be able to:

- **Describe process of pre operation chemical cleaning of boiler and post operation cleaning after operation of the unit considerable time.**
- **Explain activities associated with various stages in chemical cleaning through passivation.**

Chemical Cleaning of Boiler

- Pre-operation chemical cleaning before operating unit
- The nature of deposit/scale in case of preoperational chemical cleaning is midscale

Post Operation Chemical Cleaning after operation of the unit for considerable time

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- In post operation cleaning the water born deposits and corrosion products are removed
- Solvent formulation used in this cleaning where copper deposit are more than 5%. The following mixture chemical is used:

✓ 1% w/w citric acid

✓ 0.5% w/w sodium bromate

✓ Ammonia to give Ph 9.5

✓ Re-circulating temperature 50°C

Post Operation Chemical Cleaning after operation of the unit for considerable time

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- For Iron Removal:
- 3% w/w citric acid
- Approved inhibitor like Rhodine 213
- Ammonia to raise the Ph 3.5 – 4
- Circulating temperature 90°C

OR

- 5% w/w HCL
- 0.5% w/w Ammonia Bi-Fluoride
- Approved inhibitor like Rhodine 214

Post Operation Chemical Cleaning after operation of the unit for considerable time

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- In case copper is less than 5% in deposits the use of thio-urea for complexing the copper is sufficient for removal of copper with iron
- After copper and iron removal the boiler is neutralized and rinsed to removed residual acid under nitrogen capping.

Passivation

- First Stage passivation is carried out by re-circulating DM water at temperature 85°C, Ph 9.5 and Hydrazine concentration 200 Ppm for 20 hours at temperature 90-95°C

Passivation

- Second Stage Passivation:

  The Super heater plugin is removed. Provisional equipment dismantal and boiler is made ready for normal operation. Boiler is filled with 200 Ppm concentration of Hydrazine and Ammonia to raise Ph to 9.6. The boiler is lighted up and pressured is raised to 40 Kg per Cm2

- ✓ The sample is to be tested for Hydrazine concentration and should not be less than 25 ppm
- ✓ After 24 hours fire should be killed and boxed up
- ✓ Open super heater vent at 90°C and boiler is drained, the second stage passivation marks completion of chemical cleaning