

Best Practices Adopted By CSTPS For The Improvement Of Performance

1) REDUCTION IN BOILER TUBE LEAKAGES:

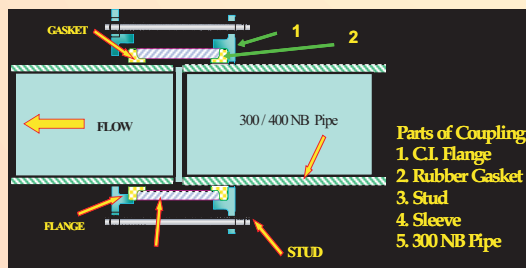
- a) Identifying Erosion prone Zones as a Preventive Measures
- b) Preparation of Action plan & its implementation
- c) Implementing Other O&M Actions to reduce Boiler Tube Leakages
- d) Monitoring effectiveness of action & correction thereof

2) ACTION TAKEN TO MINIMISE COAL LEAKAGES IN PLANT AREA

- a) Use of ceramic lined straight pipes and bends.
- b) Modification of Pyrite hopper of coal mill to reduce frequency of reject gate choke up.
- c) Doors of pyrite box, brush area, ball area have been modified by providing male female joint to get perfect sealing.

3) DEVELOPMENT OF EXPANSION JOINTS TO REPLACE SLEEVE COUPLINGS :

In CSTPS **Total 14 Ash disposal lines of total length 186Kms.** On these lines mechanical sleeve couplings shown below was provided at 15m interval each.

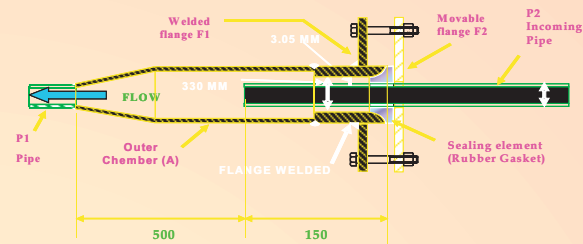


Total 12120 mechanical sleeve couplings were provided on completes 186KM line.

Due to huge number of leakages CSTPS has to face problems like Environment problems, Spoiling of standing crops in farmers field, Line availability is affected, Some time generation loss may also occurred, Pressure from district Administration, Excessive expenditure for attending these leakages about Rs 156

lacks /annum, Excessive water / Auxiliary consumption, partial line choke up on several occasions, Mental bourdon on operation & maintenance staff etc.

To overcome above problems expansion joint is designed on basis of our experience and mechanical sleeve coupling.



This newly developed expansion joints are provided at every 300mtr The complete 12120 mechanical sleeve coupling are removed, line is continuously welded and provided with 460 developed expansion joints.

4) Adoption of Knowledge based maintenance for Reduction of Pipe Breakages

In CSTPS **Total 14 Ash disposal lines of total length 186Kms.**

Pipe breakages observed due to thinning of pipe due to erosion. Due to breakages ash disposal lines get choke up frequently costing huge accumulation of ash.

On the basis of historical data of reduction in thickness & wear pattern, the pipe line is classified in A,B & C zones.

To extract 100% life of pipe action plan was prepared & adopted. Like

- i) Pipe removed from A-zone (Average life 3 to 6 years).
- ii) Removed pipe from A-zone is reutilized in C-zone. It will give life about 4 to 6 years. at this position the minimum thickness is about 3.5mm.
- iii) Some pipe removed from C-zone is again reutilized in ash bund for expansion of line. (life is 1.5 years).
- iv) The scrap thinned removed pipe from ash bund is finally reutilized for supporting structure work.

5) Best practices adopted by Electrical maintenance

- a) Making of Local Testing Kit for No-Load Trial of LT motors in the Section.

- b) Additional Earthing to 400KV consumption, partial line choke up on several Rating Station & Generator Transformers
- c) Implementation of Diagnostic Testing procedures & Condition Based Maintenance of Electrical Auxiliaries
- d) On line Oil Filling in Critical X'mers (GTRs / UATs / SATs / Station X'mers)
- e) Modifications in Power Junction of Motors; by introducing intermediate J.B. and connecting Copper Flexible cable in the power J.B. of the motors.
- f) Modification of Rotors of MDBFP motors of Unit # 5,6 & 7.
- G) Retrofitting of HT Breakers of Ash Handling Plant & In-plant switchgear Unit # 5/6.

Best practices in CHP

- a) To reduce coal spillage Troughing angle of conveyor system increased from 200 to 300.
- b) To bring down Heavy maintenance of Screen Feeder at Unit-7 CHP, Screen Feeder changed into Wobbler Feeder.
- c) Frequent breakages of haulage ropes in Ariel Ropeway is brought down by Periodical replacement of haulage rope of ARW.

Best practices by POG group

Various Performance tests carried out by PO Group in order to monitor and maintain the unit performance

- 1)** Dirty Pitot tube test (4 test per mill per year)
 - Velocity of fuel air mixture in coal pipes is determined under actual operating conditions for detecting imbalance in dirty air flows amongst different burners.
 - Pulverized coal fineness, air fuel ratio, coal flow distribution are evaluated by extracting pulverized coal sample iso-kinetically & relative feeder calibrated to ensure proper combustion in furnace.
- 2)** Fuel air mixture temp (fortnightly)
Fuel air mixture temp is measured to ensure spontaneous combustion in furnace.
- 3)** High Velocity Thermocouple test (Monthly)
 - Flue gas temp is measured at goose

neck to determine temperature stratification at furnace exit and actual gas composition, air filtration levels, oxygen stratification at furnace exit are determined.

- 4)** Air Pre Heater Performance test (Monthly)
 - Air leakages in air pre heaters are quantified by O2 measurement. Flue gas sampling & temperature measurement is taken by installing probes in grid at air heater inlet & outlet.
- 5)** High Volume Sampler test (Quarterly)
 - Unburnt carbon in fly ash is determined by collecting sample of flue gas at near Economiser hoppers. Direct heat loss due to carbon loss is calculated.
- 6)** SADC & Fuel Air Damper Checking (Fortnightly)
 - Secondary air & fuel air dampers are checked to confirm correct position of dampers as per command to ensure proper air flow for combustion.
- 7)** Furnace Temp mapping (Fortnightly)
 - Temp mapping in furnace is carried out with infrared thermometer to find out low heat transfer zones & flame temp contour.
- 8)** High energy drains temp mapping. (Fortnightly)
 - High energy drain valves temp mapping to know heat energy wastage through passing valves.
- 9)** Cooling Tower Performance test (Monthly)
 - Approach, cooling range & effectiveness of cooling tower are calculated to judge the performance and compared with design values. Blade angle adjusted for optimum performance.
- 10)** Unit Performance Test (Monthly)
 - Monthly Performance test is carried out at stable load by optimizing all critical parameters to calculate Boiler efficiency, condenser performance, air heater performance, turbine cylinder efficiencies, LP & HP heater performance, Gross Turbine Heat Rate etc. The results are compared with design & last months performance.