EVENT ANALYSIS REPORT

UNIT NO : 04	TPS : Khaperkheda TPS		Unit Capacity : 210 MW	
1. *HO Code :	Station Code : T003	Time – 23:17 Hrs	Date - 19/06/2015	No. of days from last sync. : 71 days

2. Operating conditions at the time of Event :-

Load	Coal Cycles in service	Oil Support
80 MW	C, D	Nil

3. Nature of Event: AOH carried out.

4. Name of First Up , Main Protections & Protection on which GCB tripped :

Turbine Hand tripped**(First Up)**, MFT Operated, Turbine Tripped ,Generator Protection operated, GCB opened on RPP.

5 A) Observations: Shaft vibration 2x was on higher side i.e. in the range of 180 micron.

5 B) Remedial Action/work done: - Set withdrawn for dynamic balancing of rotor. Weight added on turbine shaft at HPT, IP&LPT. Vibration level reduced considerably.Dynamic balancing done.

Following weight added:

1) HPT (front)-728 gms
2) IPT(front)-805 gms
3) LPT(rear)-1040 gms

TIC: 1. Routine checkup carried out.

BM: List of work carried out during O/H is attached separately.

EM: List of work carried out during O/H is attached separately.

TM: List of work carried out during O/H is attached separately.

6. Root Cause Analysis : Set withdrawn for AOH.

7. Preventive action suggested (Short Term) :-

8. Preventive action suggested (Long Term) :-

9. Similar event occurred last time:-	Unit No # 4 , 210MW	Time : 15:25Hrs	Date: 01/06/2013

Event: : Set Withdrawn for "Capital Overhaul".
Remedial Actions : Capital Overhaul of Boiler and Turbine carried out.

9A. Implementation Status of Long Term/Short Term measures stated at Sr No 7 & 8 :-

10. Boiler lighted up	Time – 10:55 Hrs	Date- 16/07/2015
11. T-A Set Synchronized	Time – 01:34 Hrs	Date-17/07/2015

12. Remark :-

Chief Engineer

13. Recommendations of Works Section:

1. Procurement/Replacement Plan:
2. Operational Error:
3. Delay in Maintenance:
4. Delay in bringing back the Unit:
5. Training of Staff:
6. Whether remedial action is completed satisfactory & point is closed:

C E/Dy C E (Works)

MAJOR JOBS TAKEN UP IN UNIT NO. 4 AOH

A) **BEST MAINTENANCE PRACTICES IMPLEMENTATION**

1) High pressure water jet cleaning of external tube surfaces of boiler
2) Preservation of CDS tubes

B) **CONDITIONS ASSESSMENT WORK**

1) RLA study including plastica replica, fibroscopic inspection, erosion profile mapping, IOT study and headers & coils checking. Sampling for deposit quantity analysis and creep rupture test.

C) **ACTION PLAN (LONG TERM) IMPLEMENTED.**

1) Repair of 24 Modules of economiser coils according to thickness survey.

D) **REGULAR WORK**

1) Erection of cup lock scaffolding thickness survey and replacement of the CDS tubes having thickness reduction more than 25%

Water wall = 2144 Joints

Super Heater = 533 Joints

Economiser = 935 Joints

Total = 3612

E) Servicing of HP valves at Feed station, Spray station, Boiler filling and draining station. Servicing of safety valve, CBD, EBD, Startup, sampling valve, Economiser valve, Super heater drain valve,

F) Replacement of coal burner tips,

G) Replacement of air preheater baskets

H) Bottom ash hopper strengthening and application of refractory.

I) Auxiliary air damper and Burner tilt servicing and trial.

J) Other Works

1) CAVT of boiler 2nd Pass
2) Remote electromagnetic field technique used to check tube internal surfaces.

Following tubes of rear "S" panel were replaced.

Tube no. 17, 22, 28, 33, 54, 55, 102, 146

Following tubes of front "S" panel were replaced.

Tube No. 134 & 144.

3) CFM analysis of duct and installation of diverter plates

RH outlet header partition plate removal procedure

During the RLA study of boiler unit-4, it is observed that RH outlet header partition plate is in damaged condition.

Observations:

Partition plate weld area is detached from the weld portion and is covering the header stubs, which may block the flow of steam in turn, there are chances of starving the RH sections. Hence it was necessary to remove the partition plate completely from the header.

The following procedure adopted for removing the partition plate:

1. Arrested the movement of the RH piping with adequate supports at both sides to restrict the movement towards Front/Rear, Top/Bottom and LHS/RHS by suitable means.
2. Stub holes inside headers to be covered to avoid entry of foreign materials.
3. Reducer/Spool piece between the header and RH outlet pipe is to be cut by grinding/hacksaw cutting. Before cutting the reducer, the header fixed by temporary supports to avoid any movement from the original position.
4. Partition plates fully removed by entering the RH outlet header.
5. Inside header all existing welding and left out partition plates removed and cleaned by grinding without affecting the header shell material.
6. Ensured inside portion of the header thoroughly cleaned
7. The reducer re-welded to the RH outlet header as per the BHEL welding procedure
8. The NDT (LPI, UT) conducted at butt joints and ensure the weld is free from defects. SR carried out
9. All the temporary supports are removed and piping is insulated
10. Reheater Hydraulic Test Carried Out.

Ex. Engineer (B M)
Dy BE

List of work carried out during Unit#4 overhauling : TM-I

T/G :

- All bearings 1 to 7 inspection carried out.
- Bearing no. 2 & 4 replaced.
- MOP revisioning work done, front & thrust bearings replaced.
- Barring gear clutch & its outer ring replaced.
- LPT rear gland box key slot matching, all keys replacement done
- H_2 seal rings of both sides (E/E & T/E) replaced.
- HPCV-1 complete valve overhauled.
- H_2 purging line to atmosphere has been modified.
- Radiographic test of suspected welding joint corresponding to T/G valves has been conducted.

Indoor:

- Overhauling of AS-101,101A,102,111,306;SPR-3,13;DR-6,11 carried out.
- Drain valve of PRDS high capacity, PRDS header & HPH-5 drip line replaced.
- Chiller water line cooler header of SWAS lab replaced.
- Chiller water tank float valve replaced.
- PRDS atmospheric vent valve, interconnection valve, GS supply main valve glands replaced.
- Bend of CBD tank drain line to atmosphere replaced.
- CEP-A & B Alignment check & glands, oil replaced & their strainers cleaned.
- Vacuum pump A&B glands replaced & alignment check done.
- FD-7,8,9,10,11 overhauling done.
- DR-2 & 35 overhaul done.
- MAL-11,12,22,26,65 overhauling done.
- HRH-209 replacement done.
- All BFP suction v/v done.
- All BFP R/C valve overhauling done.
- Gland steam supply/ Gland steam leak off/ Gland steam bypass valve overhauling done.
- All BFP suction & discharge v/v gasket replaced,bearing inspection & overhauling of cooling water valve, all cooler flusing done.
- BFP-A booster pump & main pump bearing replaced.
- BFP-B booster pump bearing pump replaced.
- Condenser cleaning done by means of bullet shot method.

Out door:

- All C.T fans preventive maintenance taken.
- A.C.W-3 & 4 preventive maintenance taken.
- C.T pond cleaning done.

3/8/2015

E.E(T.M-1)

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U#4 ANNUAL OVERHAUL REPORT – EM-I.

Following works are carried out during U#4, AOH starting from dated 19/05/2015 to 15/06/2015.

1) GENERATOR :

a) Generator internal inspection work carried out.

b) Generator core found damaged repaired by electroplating method.

c) Slip ring cutting / polishing work carried out.

d) Field breaker preventive maintenance work carried out.

e) AVR Thyrister blower motor overhaul work carried out.

Following tests are carried out on Generator.

a) ELCID test, Air Leak Test of stator.

b) Rotor Air Leak Test, Rotor ultra sound test, Rotor RSO test.

c) Generator dynamic test.

2) HT TRANSFORMERS :

a) GTR / UAT / STN oil filtration work carried out.

b) GTR / UAT / STN painting work carried out.

c) GTR oil cooler cleaning work carried out.

d) UAT / STN external cooling fan overhaul work carried out.

e) Various test on HT transformer carried out.

i) LV Test

ii) HV Test

iii) SFRA Test

iv) Protection Trial

f) UAT / Station Bus Duct inspection work carried out.

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3) HT SWITCHGEAR :

a) 4CA / 4CB unit board overhaul work carried out.

b) OCK / OCJ station board overhaul work carried out.

4) LT SWITCHGEAR :

a) Boiler valve & Boiler MCC overhaul work carried out.

b) Turbine Valve & Turbine MCC overhaul work carried out.

c) Unit & Station Emergency board overhaul work carried out.

d) CT Fan MCC overhaul work carried out.

e) Compressor board overhaul work carried out.

f) Soot blower MCC overhaul work carried out.

5) HT MOTOR

a) Coal Mill - 4A/4B & 4C motor overhaul work carried out.

b) PA Fan - 4B & 4F motor overhaul work carried out.

c) BFP - 4A, 4B & 4C motor preventive maintenance work carried out.

d) Coal Mill - 4D , 4E & 4F motor preventive maintenance work carried out.

e) PA Fan - 4A, 4C, 4D & 4E motor preventive maintenance work carried out.

f) CEP - 4A & 4B motor overhaul work carried out.

g) FD Fan - 4A & 4B motor overhaul work carried out.

h) ID Fan - 4A & 4B motor preventive maintenance work carried out.

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6) LT MOTOR

a) Air heater - 4A & 4B main motor overhaul work carried out.

b) Seal Air Fan - 4A & 4B motor overhaul work carried out.

c) Coal feeder - 4A, 4B, 4C, 4D, 4E & 4F motor & dynodrive overhaul work carried out.

d) Vacuum pump - 4A & 4B motor overhaul work carried out.

e) All BFP LOP / AOP motor preventive maintenance work carried out.

f) Scanner fan motor overhaul work carried out.

g) DC AOP / Scanner Fan / JOP / SOP motor preventive maintenance work carried out.

h) AC SOP both motor overhaul work carried out.

i) AC JOP / AOP motor preventive maintenance work carried out.

7) BATTERY

a) 220V set-1 / set-2 station battery capacity test & cleaning work carried out.

b) 24V set-1/set-2 capacity test & cleaning work carried out.

c) UPS Battery capacity test & cleaning work carried out.

8) ESP:

a) LT MCC board overhaul work carried out.

b) Hopper heaters & support insulator of all pass checking work carried out.

c) All rectiformer preventive maintenance work carried out.

5/8

Executive Engineer (EM-1)