

EVENT ANALYSIS REPORT				
UNIT NO : 04	TPS : Khaperkheda TPS		Unit Capacity : 210 MW	
1. *HO Code :	Station Code : T003	Time -07:19 Hrs	Date - 07/03/2017	No. of days from last sync. : 24 days
2. Operating conditions at the time of Event :-				
Load		Coal Cycles in service	Oil Support	
190 MW		A, B, C, D & E	NIL	
3. Nature of Event : T. A. set withdrawn due to boiler tube leakage at Economiser zone.				
4. Name of First Up , Main Protections & Protection on which GCB tripped : Drum Level Very Low (First Up), MFT Operated, Turbine Tripped, Gen. Class-A Operated, Gen. Protection Operated				
5 A) Observations : On dt. 07/03/17 at 07:19 hrs. set was on load at 190 MW with five coal cycles in service (F-S/by) & no oil support. DM make-up found increased. Furnace Draft found on positive side. Heavy abnormal sound noticed at 33.8 mtrs level. Suddenly, drum level found dropped and boiler tripped on 'Drum Level Very Low' protection. This resulted in tripping of unit, when the load was 190 MW. GCB opened on reverse power protection. After completion of BTL attending work, Unit-4 was ready for light up from 10.00 hrs on dt. 08-03-17. But, MSLDC by email dtd. 07/03/17 already requested to give Zero Schedule to Khaperkheda Unit-4 from its availability, as per SLDC MoD stack for Feb-17, till further communication. In view of power scenario, MSLDC requested by email dtd. 22/03/17 to give schedule to Khaperkheda Unit-4 (VC-Rs. .9802), as per SLDC MoD stack for Mar-17 from 05:00 hrs of Dt. 23-03-2017. Accordingly, boiler was lighted up at 23.35 hrs on dt. 22-03-17. But, it was hand tripped at 05.03 hrs on dt. 23-03-17 due to jamming of Air Heater-4B, resulting from molten metal entrapped between rotor & sector plate. Stand-by air motor also failed to rotate the rotor. After completion of APH-4B maintenance work, Unit-4 synchronised at 05.45 hrs on dt. 26-03-17				
5 B) Remedial Action/work done : <u>Primary Failure</u> - Economiser Upper Bank Coil no.152, Tube No.2 found punctured. <u>Secondary failure</u> - (1) No secondary failure observed. (2) During hydraulic test at 50 kg/sq.cm. Economiser front hanger tube no. 46 oozing observed. <u>Work Carried Out</u> - Total No. of HP welded Joints = 04 Nos. (1) Economiser upper bank coil no.152 attended by welding hemispherical spool at economiser intermediate and economiser inlet header. (2) Replacement of economiser front hanger tube no.46, carried out. Maintenance work of APH-4B : Molten metal cleared from APH-4B. Diaphragm locking of adjacent sector carried out. Supporting grating of HE, HIE & CE fitted to the respective sectors. Seal plates welded to HE end to control the flue gas flow and the gap kept in line with spacing of CRCA carbon steel sheets of damaged baskets. Rotor leveling carried out. A separate sheet showing details of maintenance work carried out, is enclosed herewith. After completion of necessary maintenance, trial of air motor & AC motor (Current - 6 Amps) taken and found ok.				
6. Root Cause Analysis : Localized Flue gas erosion of tube no. 2 of economiser upper bank coil no.152 is the root cause of failure.				
7. Preventive action suggested (Short Term) :				
8. Preventive action suggested (Long Term) : (1) Dummied coil no. 152 will be normalized during forthcoming overhaul of Unit No.4. (2) Replacement of all the economiser coils will be carried out during forthcoming overhaul of Unit No.4. (3) Total 60 Nos. of APH-4B baskets for two sectors will be replaced during forthcoming overhaul of Unit No.4. (4) High pressure water jetting will be done to cold end baskets in forthcoming overhaul of Unit No.4.				
9. Similar event occurred last time:		Unit No # 4 , 210 MW	Time : 12:22 hrs.	Date : 28/12/2016
Event : T. A. set forced withdrawn due to boiler tube leakage at economizer zone. Remedial Actions/work done : (1) Economizer upper bank coil no, 160, 161 & 162 attended by welding hemispherical spools at economizer intermediate and economizer inlet header. (2) All the eroded and punctured SCW manhole door opening bends & tubes replacement work carried out. Total No. of HP weld joints = 12 Nos				
9A. Implementation Status of Long Term/Short Term measures stated at Sr No 7 & 8 :				
10. Boiler lighted up		Time - 23:35 Hrs	Date - 25/03/2017	
11. T-A Set Synchronized		Time - 05:45 Hrs	Date - 26/03/2017	
12. Remark : (1) Boiler Tube Leakage : From 07.19 hrs of dt.07.03.17 to 10.00 hrs of dt.08.03.17 (2) 'Zero Scheduling' outage : From 10.00 hrs of dt.08.03.17 to 05.00 hrs of dt.23.03.17 (3) R&M (APH-4B) work : From 05.00 hrs of dt.23.03.17 to 05.45 hrs of dt.26.03.17				


 Chief Engineer

KHG / BM - I / CORR / LOCAL / 2017 / 64

Date » 03/04/2017

To,
Executive Engineer (OS-I)
Khaperkheda TPS
Khaperkheda

Though Superintending Engineer (M-I)

Sub » Work carried out of unit no. 4 APH 4B.

Work of APH - 4B carried out from dated 23/03/2017 to 25/03/2017. Unit no. 4 was withdrawn on dated 23/03/2017 at 05:04 Hrs due to tripping of APH 4B. Inspection of APH 4B is carried out at 19:00 Hrs. on dated 23/03/2017 as jamming of APH observed. After inspection it was found that following APH baskets have been burnt and molten metal of basket was been fallen down in hopper and some of the molten metal is entrapped between rotor and sector plate, leads to jamming of APH and resulted into tripping of APH.

Sector	HOT END	HOT INTERMEDIATE END	COLD END
Sector - I	B, C, DE & E-27 = 4	B, C, DE & E-27 = 4	B, C, DE & E-27 = 4
Sector - 2	B, C, DE & E-27 = 4	B, C, DE & E-27 = 4	B, C, DE & E-27 = 4
Total 2 sector	Total baskets = 24		

In short two sectors of HE, HIE and CE baskets elements have been damaged.

WORK CARRIED OUT :-

- 1) Molten metal removed from FD duct.
- 2) Diaphragm locking of adjacent sector carried out.
- 3) Support grating of HE, HIE & CE have been fitted to the respective sectors.
- 4) Seal plates have been welded of HE end to control the flue gas flow and the gap is kept in line with the spacing of CRCA carbon steel sheets of damaged baskets.
- 5) Rotor leveling carried out.
- 6) Trial on air motor taken.
- 7) Trail on AC motor taken (Current 6 Amp)
- 8) Clearance given for boiler light up on dated 25/03/2017 at 23:15 Hrs.

CORRECTIVE & PREVENTIVE ACTIONS :-

- 1) Total 60 Nos. of baskets for two sectors will be replaced in forthcoming overhaul.
- 2) Remaining baskets will be reversed and cleaned as they were replaced in 2015.
- 3) High pressure water jetting to cold end baskets in forthcoming overhaul.

[Signature]
03/04/17
Executive Engineer (BM-I)