EVENT ANALYSIS REPORT				
UNIT NO : 03	**TPS : Khaperkheda TPS**		**Unit Capacity : 210 MW**	
1. *HO Code :	**Station Code : T003**	**Time** – 08:40 Hrs	**Date** - 27/11/2016	**No. of days from last sync. :** 15 days

2. Operating conditions at the time of Event :-

Load	Coal Cycles in service	Oil Support
80 MW	B, C & D	NIL

3. Nature of Event: TA set forced withdrawn due to boiler tube leakage at LTSH zone.

4. Name of First Up , Main Protections & Protection on which GCB tripped :
Hand Tripped (First Up), MFT operated, Turbine Tripped, Generator class A tripped.

5 A) Observations: - On dt. 27/11/2016 at 08:00 hrs, set was on load at 160 MW with four coal cycles in service (A, F-standby) and no oil support. Considerable variation observed in feed flow. Drum level found dropping and DM make-up found increased. After confirmation of boiler tube leakage in LTSH zone, load reduced gradually by withdrawing coal cycle 'E'. Set hand tripped at 08:40 hrs when the load was 80 MW with C/M-B, C & D in service.

5 B) Remedial Action/work done : -
Primary Failure – LTSH Coil No.96 Tube No.2 near LTSH inlet header connecting tube found punctured.
Secondary Failure –
1) LTSH coil no. 96 tube no. 1 found punctured and tube no.3 found eroded.
2) LTSH coil no. 97 tube no. 1 found punctured and tube no.3 found eroded.
3) LTSH coil no. 95 tube no. 3 found punctured and tube no.2 found eroded.
4) LTSH coil no. 94 tube no. 1 found eroded.

Work carried out : Replacement of punctured and eroded tubes carried out. (**Total HP weld joints = 16 Nos.**)

6. Root Cause Analysis : Pulsating load variation and cyclic loading & unloading resulting into thermal stress rupture is the root cause of failure of Tube No. 2 of LTSH Coil No. 96 near SHH-9 header and new coil connecting tube.

7. Preventive action suggested (Short Term) :- In order to avoid boiler tube leakages, all the concerned are instructed to adopt a practice of raising / lowering the load at the rate of 1.5 to 2.0 MW per min. A circular (No. KHG / SE (OP-I) / 619 dated 3 DEC 2016) is issued in this regard and a copy of the same is enclosed herewith.

8. Preventive action suggested (Long Term) :- DP test & ultrasonic test of all stub connection joints of LTSH coils with header SHH-9 will be carried out during forthcoming AOH of Unit No.3.

9. Similar event occurred last time:-	**Unit No # 4 , 210 MW**	**Time** : 12:47 Hrs	**Date:** 27/10/2014

Event: TA Set Withdrawn to attend "Boiler Tube Leakage" at 'LTSH Zone'.
Remedial Actions: 1] Replacement of LTSH coil no. 57, tube no. 25

2] Replacement of LTSH coil no. 55, tube no. 21, 22, 23, 24 & 25.

3] Replacement of LTSH coil no. 56, tube no. 25

4] Replacement of LTSH coil no. 54 tube no. 21, 22, 23 & 24.

5] Replacement of LTSH coil no. 62, 64, 68, 70 and tube no. 25 of each coil.

6] Replacement of LTSH rear hanger tube no. 27 & 29

7] Economizer upper bank coil nc 159 dummied by providing hemispherical spoc' at eco. Intermediate and Eco. Inlet header as thorough inspection & thorough repairs are not feasible due to space constraints.

8] LTSH coil no. 55-56 lifting and lowering done for repair by cutting end connection.

Total No. of H.P. weld joints. = 73 Nos.

To attend this BTL it was necessary to lift a LTSH module having coil no. 55-56 which includes lifting of the coils, cutting of end connections & attending the repairs and then lowering of the coils along with HP joint end connection.

1] LTSH coil no. 55-56 top & bottom end connection -- 25 Joints

2] LTSH coil no. 54 tube no. 21, 22, 23 & 24 -- 08 Joints 3] LTSH coil no. 55 tube no. 21, 22, 23, 24 & 25 -- 14 Joints. 4] LTSH coil no. 56, tube no. 25 -- 02 Joints. 5] LTSH coil no. 57 tube no. 25 -- 02 Joints 6] LTSH coil no. 62, 64, 68 & 70 tube no. 25 each -- 16 Joints. 7] Economizer upper bank coil no. 159 -- 02 Joints 8] LTSH rear hanger tube no. 27 & 29 -- 04 Joints		
9A. Implementation Status of Long Term/Short Term measures stated at Sr No 7 & 8:-		
10. Boiler lighted up	**Time** – 11:28 Hrs	**Date** - 28/11/2016
11. T-A Set Synchronized	**Time** – 17:46 Hrs	**Date** - 28/11/2016
12. Remark: - PRDS Interconnecting valve, AS-313 attended for its mechanical jamming. **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)		

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KHG/SE (OP-I)/ No 619 DATE: 13 DEC 2016

CIRCULAR

Subject: - The best practice to be adopted to reduce Boiler tube leakage frequency and light up activity time after boiler tube leakage.

1) To reduce boiler tube leakage at U-1 to 4 adopt practice of gradual raising / lowering of the load during LD backing down shall be done within a span of 30 minutes from 160 MW to full load or vice versa , irrespective of the instructions from LD to raise / lower the load immediately.

2) At the time of boiler tube leakage failure, force cooling of boiler for first 5 Hrs. is to be done with total air flow 450 T/Hrs. and next 4 Hrs. force-cooling is to be done by 500 T/Hrs.

3) PRDS is to be charged from other units whenever there is clearance from BM-I for hydraulic test and steam heating shall be started with due clearance from BM-1 to start boiler heating by modified steam purging oil guns system so as to reduce light up activity time & increasing boiler metal temperature.

Superintending Engineer (OP-I)
MSPGCL, T.P.S., Khaperkheda