TRIP ANALYSIS REPORT

TRIP ANALYSIS REPORT /TAR-07/ UNIT 1 / 2016 **Dt. 26-05-16**

OCCURRENCE:

(a) **Condition:** Load: **367 MW** at 15:55 hrs with 5 Mills in CMC mode and coal flow 174 T/hr.

(b) **Incident:** Turbine tripped on Generator electrical protection (Low forward power) at **15:55:46** hrs on 25.05.16 and the boiler tripped at 10:56 hrs on MFT due to drum level v low.

OBSERVATIONS FROM SOE/ALARM PAGES AND BOARD ENGINEER FEEDBACK:

15:55:40.965 hrs: HPCF Pump-2 MCC Disturbance.

15:55:41.750 hrs: HPCF-Pump1 "ON"

15:55:44.167 hrs: Position of INTCPT ESV-2 RHS Close.

15:55:44.262 hrs: Position of INTCPT ESV 1 LHS Close.

15:55:44.386 hrs: Position of HP ESV 2 RHS Close.

15:55:44.418 hrs: Position of HP ESV 1 LHS Close.

15:55:45.090 hrs: All ESVs closed.

15:55:46.677 hrs: Turbine tripped.

15:55:47.142 hrs: HP BP Valve Fast Open.

15:55:47.832 hrs: STG1 Trip relay 286A operated.

15:55:47.834 hrs: STG1 Trip relay 186A operated.

15:55:47.844 hrs: Generator Electrical Protection operated.

15:56:07.653 hrs: Drum level v.low>5s.

15:56:07.653 hrs: MFT acted.

ANALYSIS:

Unit was in service with a load of 367 MW in CMC mode with 5 mills (B,C,D,E and F), coal flow 174 T/hr just before tripping.

Turbine tripped on Generator electrical protection due to low forward power.

The HPCF pump 2 tripped on MCC disturbance at 15:55:40 hrs. At the time of tripping the HPCF header pressure was 38 ksc.

HPCF pump 1 started on auto at 15:55:41hrs.As per the trend the header pressure got reduced to 14 ksc at 15:55:44.hrs and got raised to 35 ksc at 15:55:46 hrs.

In the meantime all ESV got closed at 15:55:45hrs which lead to turbine trip on low forward power.

The HP BP valves fast open command initiated. But both HP BP vlv did not open as already BP BPV2 was in isolated condition and other side BPE1 was having problem.

Hence the boiler got tripped on drum level v.low at 15:56:07 hrs.

After getting clearance, the boiler was lighted up at 17:59 hrs with one HP BP valve (left BPV1) and its spray valve BPE 1 in manual operation (torque motor problem) at local and the unit was synchronized at 20:55 hrs.

CONCLUSION:

It is concluded that the Turbine trip on generator protection was due to low forward power.

It is concluded that the reason for low forward power was due to all ESV closed.

It is concluded that the reason for all ESV closure was due to loss of Control fluid header pressure.

It is concluded that the loss of control fluid pressure was due to MCC disturbance in running HPCF pump 2 due to earth fault and reserve pump 1 came on auto.

It is concluded from the trend that the header pressure was maintained for 3 secs only even after tripping of HPCF pump-2. Accumulator function was not effective.

Though the standby pump came immediately, it took 2 secs to attain the header pressure and mean time the turbine got tripped.

Boiler got tripped on drum level low due to non-availability of HP bypass system.

RECOMMENDATIONS:

- All the accumulators in the control fluid line shall be checked for nitrogen pressure periodically by Turbine Maintenance to avoid control fluid pressure loss during auto start of standby pump.
- After ensuring the healthiness of accumulator, its function shall be checked during the shutdown by tripping the running HPCF pump.
- HP BP BPV2, BPE 2, BPE 1 and BD valve operation shall be made ready during the ensuing shutdown to save boiler on turbine trip.

CM/ Mech CM/Ins DGM/ Comm DGM/ Elec

DGM/Operation