TRIP ANALYSIS REPORT

TRIP ANALYSIS REPORT /TAR-014/ UNIT 1 / 05.09.2017 **Dt. 09-09-17**

OCCURRENCE:

(a) **Condition:** Unit-1 was in service with 89 MW in LP mode with 2 mills and 7 oil burners in service at 9:23 hrs on 05.09. 2017.After synchronization of the unit at 7:45 hrs, load raising was in progress.

(b) **Incident:** Turbine was hand tripped at 9:36:05 hrs on 05.09.17 due to sudden closure of HOTV and followed by boiler tripped at 9:36:19 hrs on MFT (RH protection)

(c) **SOE OF DDCMIS ALARM PAGES:**

TIME	DESCRIPTION	STATUS
09:26:53	Atomising pressure very low.	True
09:26:58.763	HOTV close	true
09:36:00.	Emergency Trip Operated	True
09:36:00.	Turbine Trip CH1.2 Command	On
09:36:00	Turbine Trip CH 1.1 Command	On
09:36:00.	HPBP valve Fast Open Acted	True
09:36:00.	BP-2 valve Fast Open	True
09:36:00.	BP-1 Valve Fast Open	True
09:36:00.	Generator Electrical protection	Operated
09:36:10.	BP-2 valve >2 % open	True
09:36:10.	BP-1 valve Malfunctioning.	True
09:36:14	Pulveriser E tripped.	True
09:36:18	RH protection(d7)	Active
09:36:18	MFT Ch1	Acted
09:36:18	MFT Ch-3	Acted
09:36:18	MFT Ch-2	Acted

ANALYSIS from SOE and feedback from board engineers.:

1. Unit was in service at 89 MW and 2 mills with 7 OBs were in service.
2. Atomising pressure very low alarm appeared at 9:26:53 hrs and HOTV got closed at 9:26:58.
3. Though the oil valve closed, the boiler was in service with 2 mills of coal flow 108 T/hr.
4. Though the load was reduced to 28 MW from 89 MW, the MS pressure could not be maintained. Hence the Turbine was hand tripped at 9:36 hrs. Approximately unit was in service for 10 min without oil support.

   At 07:55:40.168 unit-1 tripped on MFT (both IDFs Off) on loss of 11kV, 3.3 KV and 0.4 KV supply. All the running equipments tripped in unit-1 & 2. Meantime DG set

came in auto and 0.4kV supply was fed N/E bus. In Unit 1, as 24V C&I Supply MCB tripped in CRE 61 Panel, the alternator breaker from DG set was closed manually and subsequently MCB was normalized.

5. DC driven equipment for all critical equipment were in service.
6. On failure of 11 kV & 3.3 kV all running equipments tripped and some of the critical equipments are mentioned below:
    a. CW Pump-A & B.
    b. Vacuum Pump-A&B tripped.
    c. ACW-B tripped.
    d. CEP-B & C tripped
    e. HPCF-1 tripped.
    f. TG DMCW –A & B tripped.
    g. SG DMCW-B tripped.
    h. AOP-1 & JOP-1 tripped.
    i. HPBP OSU-1 & 2 tripped.
7. On Turbine trip, both HP Bypass valves (BPVs) opened 100 %. But BPVs couldn't be closed neither in remote nor from local due to non-availability of both OSU Pumps.
8. Condenser vacuum breaker got opened due to tripping of HPCF pump. LPBP was closed immediately to stop steam dumping inside condenser. Close command for Boiler stop valve (MSV-1&2) was given. Seal steam for both TDBFPs and main turbine was isolated. Meantime, LP Turbine rupture diaphragm (boiler side) got opened.

CONCLUSION:

Following points were concluded:

1. When MDBFP was started in unit-2, heavy current drawl was noticed momentarily. Hence, primary current (227 A) in ST-1 exceeded for more than 5.9 seconds and it tripped on Inverse definite over current protection. As ST-1 was only in charged condition, 11kV supply failed and subsequently 3.3 kV and 0.4 KV supply failed.
2. Due to non-availability of Cooling water inside condenser on tripping of both CW pumps lead to LPT rupture diaphragm explosion though vacuum breaker was in open condition.
3. Both bypasses could not be closed immediately and steam continuously supplied to condenser. this led to failure of explosion diaphragm even though vacuum breaker was opened.

4. The ST1 was charged and the system was normalized and 0BB was charged and TIE was availed for 0BD bus. The circulating water pump house service transformers are in 1BA and 2BB bus. 1BA bus gets power supply from 0BA bus and 2BB bus gets power supply from 0BC bus which in turn gets supply from 0BA bus as ST2 is under maintenance. There was a minor breaker problem in 0BA incomer breaker and that was attended and then the 11KV and then 3.3KV buses and then 0.4 KV buses were normalized.

RECOMMENDATIONS:

1. To prevent LPT rupture diaphragm explosion during station pullout conditions, following suggestions shall be adopted/implemented:
    a. Tripping of boiler on tripping of all CW Pumps(1A,1B,1C/2A,2B,1C).
    b. Protection closing of line drain MOVs before HPH 6A & 6B on tripping of both CW Pumps.
    c. For Turbine valve MCC one supply is from unit service Transformer 1DA and other supply is from N/E bus 1DG. Whenever the main supply from 1DA fails the power supply will automatically changeover to N/E supply source once the bus gets supply from the DG set. This changeover has to be checked during the next available opportunity.
    d. One HPBP OSU supply shall be taken from Normal/Emergency bus (1DG/2DG). Now both the HPBP OSU are getting supply from Turbine MCC bus (1KA/2KA).
    e. HRH ERVs shall be opened to reduce the accumulated pressure in RH coils.
2. The Normal Inverse setting of station transformer 1 and 2 may be revised from 175A 0.22sec TMS to 180A 0.26 sec TMS. However, when only one station transformer is feeding the entire station loads before starting MDBFP it should be analyzed case by case and then only it should be taken into service. The overloading capacity of transformer depends on the normal loading status of the transformer just before overloading and the average ambient temperature of medium. It may be noted that NTPL Station Transformers capacity is 63MVA each only but power stations of similar capacities are having station transformers of capacity 80MVA each.
3. The load on the CHS, shore unloader may be temporarily stopped before starting MDBFP whenever one station transformer is feeding the entire station load.

4. As station transformer capacity limitation comes when one station transformer is feeding the entire station, the process of starting TD BFP with AST without entirely depending on MD BFP in such cases may be explored and expedited.

CM/OS(T) DGM/C&I DGM/Elec DGM/O&C