UNIT TRIPPING REPORT

UNIT No: 1 STATION: NTPL,

TUTICORIN.

OUTAGE: NO. 39

REPORT NO: 39

1.Date of tripping : 16-01-2019

2.Time of tripping : 22:56 Hrs

3.Status before tripping

a) Unit load : 335 MW

b) Mills in service : A, B, C, D, & F

c) Oil guns in service : Nil

d) Boiler feed pumps in service : TDBFP A & B

e) CEPs in service : B & C

f) ID fans in service : A & B

g) FD fans in service : A & B

h) PA fans in service : A & B

i) CWP in service : A & B

4.First Up protection acted : Turbine tripped on Vac. Low

5.Similar occurrences in the Financial Year : Nil

6.Other relays/protection acted : Generator trip

7.Supporting documents attached : S.O.E & Trends

8.Any operation done prior to tripping : U#2 got tripped on Generator protn and unit supply failed.

9.Analysis of tripping :

U#2 Generator got tripped on Class A protection and all running auxiliary equipments in that unit got tripped since fast change over didn't occur. 2SG-DMCW was supplying cooling water for IA compressors, which got tripped leading to Unit#1 IA failure.

IA failure resulted in closing of Supply & Dumping control valves of Main Turbine and dumping valves of TDBFPs gland steam pressure control system. All GSC valves are Air-Fail-to-Close type except the

TDBFP Supply valve. After closure of the dumping valves, all three gland steam header pressures went to maximum due to locked up self-sealing steam. This lead to Output of Gland Steam Controllers, which were in 'auto' mode, to lower to 0%. After normalisation of IA pressure, the GSC dumping valves went to 100% open, leading to loss of gland steam header pressure of all the three machines. This lead to heavy air ingress into the condenser and the vacuum dropped to a minimum of 0.4 Ksc, before the response time of GSCs to restore the seal steam header pressures. Turbine got tripped on condenser protection at a value of 0.3 Ksc.

After the tripping of Turbine, both HPBPs got fast opened on logic, but BPV-1 got trip closed on downstream temperature high of 380 °C. Boiler got tripped on RH-Conditions protection.

10.Root cause :

IA PRESSURE FAILURE was due to the delay in changing over of DMCW source from the tripped Unit to own source. Presently changeover is done at local, manually by opening the supply and return line from the next unit and closing the same valves from the present unit.

SEAL STEAM HEADER PRESSURE buckling of the TDBFPs and Main Turbine was due to the sluggish response of the GSC controller in auto mode. Also Lock-up relay of valves were not functioning properly.

TRIP CLOSING OF BPV-1 was due to the fact that BD valve was in manual mode and not in auto. This has caused temperature rise in the BPV-2 downstream also, but it failed to trip close since the logic was in bypassed condition.

RH PROTECTION acted and Boiler got tripped. But LPBP Stop valve status is not available in SOE for analysis.

RH SAFETY VALVE FLOATED at about 49 Ksc due to BPV-2 in 50 % open condition in auto mode and both LPBP valves were kept closed and in manual mode.

11.Remedial measures taken/to be taken:

IA PRESSURE DROP was due to tripping of IA Compressors due to failure of DMCW supply. DMCW valves for both units has to be

maintained in good condition for the easy changeover of DMCW supply source in case of emergencies.

SEAL STEAM HEADER PRESSURE buckling in the TDBFPs and Main Turbine could have been avoided, if the GSC controller was taken into *manual mode* and controlled.

TRIP CLOSING OF BPV-1 was due to the fact that BD valve was in manual mode and not in auto. This has caused temperature rise in the BPV-2 downstream also, but it failed to trip close due to bypassing of the *logic*. Logics were corrected. Simulation/Protection-Bypass Register has to be updated and kept under the custody of Shift Engineer.

RH PROTECTION acted and Boiler got tripped, but u*navailability of LPBP Stop Valve Open status*, even as the other contacts, viz. ESV, IPSV, HPBP and LPBP control valves contacts were available, in SOE, trip reason could not be ascertained.

RH SAFETY VALVE FLOATED for about a couple of minutes since BPV-2 was 50 % open and both LPBP valves were closed and in manual mode. This could have been avoided if LPBP was left in the *auto mode*.

12.Time/Date of boiler light up and sync :

Light Up: 23:36 Hrs on 16.01.2019

Sync'd : 02:20 Hrs on 17.01.2019

13.Delay for light up : No delay.

14.Recommendation / Action plan :

Sl.No.	Recommendations/Action plan	Responsibility	Time line
1)	DMCW supply and return valves to IA compressor house from both the units has to be *maintained in a good condition* for the easy changeover of source in case of emergencies.	BMD	Immediate
2)	Seal steam header pressures has to be maintained by taking GSC into manual during abnormal conditions. Also Lock up relays to be made ready for the valves.	OPN & C&I	Immediate

3)	BD valve should never be left in manual mode during unit operation. Downstream temp of BPV has to be monitored during HPBP operation. Logics healthiness should be ensured, periodically. Simulation/Protection-Bypass Register has to be updated and kept under the custody of Shift Engineer.	OPN, OS & C&I	Immediate
4)	LPBP Stop Valve Open status to be made available in SOE for RH protection logic for Boiler.	C&I	Immediate
5)	MS & RH pressure should be monitored while taking HP/LP BP control into manual mode.	OPN	Immediate

15.Any specific learning / feedback :

Most of the reasons were operational and attributable to the extreme emergency situation prevailed in Unit #2 at that time. However, the importance of keeping controllers in auto and taking into manual only for dealing with emergencies needs to be emphasised. Simulation/Protection-Bypass Register has to be updated and kept under the custody of Shift Engineer.

23/1/19

CM / OS CM/EEMG DGM / C&I DGM / ELECT

DGM / O&C

Copy submitted to GM/O&M

Copy submitted to CEO / NTPL