

UNIT TRIPPING REPORT

UNIT No: 2
TUTICORIN.

STATION: NTPL,

OUTAGE: NO.47

REPORT NO: 47

- | | |
|--|--------------------------------|
| 1.Date of tripping | : 22-02-2020 |
| 2.Time of tripping | : 22.51.22 Hrs |
| 3.Status before tripping | |
| a) Unit load | : 300 MW |
| b) Mills in service | : B, C, D, E, F & G |
| 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 | : Boiler RH Protection Acted |
| 5.Similar occurrences in the | |
| Financial Year | : Nil |
| 6.Other relays/protection acted | : Turbine & Generator Tripped |
| 7.Supporting documents attached | : S.O.E & Log Book Copy |
| 8.Any operation done prior to tripping | : IPSV-1 Open LS not available |
| 9.Analysis of tripping | : |

While rolling of Unit 2 Turbine in first shift on 22.02.20 after attending BTL, it was observed that IPSV-1 Open feedback (Red colour) was not available and in DCS EHTC mimic page it was shown in Black. At local Open condition of all Stop Valves were physically checked and confirmed. The defect was reported to C&I Mtce and proceeded with rolling as immediate care was not required or possible due to

inaccessibility. This IPSV Open feedback was only indicative and not used in any trip logic.

The defect was again raised in night shift by the Operation Engineer and C&I Mtce Engineer decided to simulate 'Open' indication for IPSV-1. At 22:38 hrs IPSV-1 Open feedback was simulated but there was no colour change in the mimic.

When the mimic was opened in Editor software to check the EHTC Graphics scheme, it was observed that all Stop valves status in EHTC scheme (Both HP & IP stop valves) changed from open status (Red Colour) to close status – (Green colour). The standard convention for the unit is that, any valve if open will be indicated by red colour and if closed will be indicated in green colour. The sudden change of colour from Red to green (Apparently close) indication misguided the C&I shift executive. Suspecting Module/Tag assignment fault, the executive forced IP stop valve 1 Tag feedback corresponding to red indication (Open status) at 22.47 Hrs. IP stop valve 1 indication became Red. This further misguided the C&I executive and when IP stop valve -2 Tag feedback corresponding to red indication was forced at 22.51.10 Hrs, Both IP stop valves indicated Red. When Both IP stop valve Tag corresponding to red indication were forced, Both IP stop valve close feedback Trip contact initiated and after a 10 sec time delay unit tripped on Loss of RH Protection at 22.51.22 Hrs.

10.Root cause :

On further analysis, it was found that all 4 stop valves of EHTC scheme are linked with same Stop valve graphics. When the EHTC Mimic file was open in Editor, all stop valves turned to Green (Apparent close but actually open). The above event misguided the C&I executive and when IP stop valve 1 close feedback was forced, the valve turned Red. This further misguided the actual conditions. When IP stop valve 2 feedback was also forced Unit got tripped.

In order to verify the fault in EHTC stop valve Mimic, U#1 EHTC mimic file was opened in Editor for analysis purpose on 24.02.20 in Unit#1 EWS Server. The same set of events as happened in Unit 2 occurred in Unit#1 also. All stop valves indication changed from open (Red) to close(Green) whereas field contacts remained healthy. The condition prevails as same in Both Units Engineering servers. The status is normal in other operating workstations.

11. Remedial measures taken/to be taken:

- The faulty EHTC Stop Valve Feedback Mimic File to be corrected in Shutdown.
- The Discrepancy in EHTC mimic file is reported to BHEL EDN vide mail ref dated 27.02.20. BHEL EDN opinion is expected on the above issue.

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

Light Up: : 23:15 Hrs on 22-02-2020

Sync'd: : 01:36 Hrs on 23-02-2020

13. Delay for light up : No Delay

14. Recommendation / Action plan :

Sl.No.	Recommendations/Action plan	Responsibility	Time line
1)	BHEL EDN opinion is expected on the issue of the "Discrepancy in EHTC mimic".	C&I	Opinion Awaited

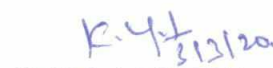
15. Any specific learning / feedback :


Discrepancy in the EHTC mimic of EWS Server of Unit#2 has given rise to confusion regarding Stop Valve status issue which ultimately resulted in the spurious tripping of Unit#2 Boiler on RH protection. This issue will be sorted out after getting expert opinion from BHEL EDN.


ADGM / OS
25/02/20


DGM / EEMG


DGM / C&I
03/03/20


DGM / ELECT
03/03/20


DGM / O&C
03/03/2020

Copy submitted to CEO / NTPL

Copy submitted to GM/O&M

Event Summary

(filtered)

11:01:35

28Feb20

9

☒ Start Time: Saturday 22/Feb/2020 22:38

☒ End Time: Saturday 22/Feb/2020 22:53


16

3006RPM

452MW

UNIT 2

Time	TagName	Description	Event Text
22/Feb/20 22:38:50	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:39:21	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.
22/Feb/20 22:40:12	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:40:14	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.
22/Feb/20 22:42:27	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:42:30	2MAB10CG001BXG01	POS OF INTCPT ESV-1 LHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.
22/Feb/20 22:47:35	2MAB10CG001CXG02	POS OF INTCPT ESV-1 LHS	ForcedVal Old=False New=True 2ATRS1_s By 162.
22/Feb/20 22:47:36	2MAB10CG001CXG02	POS OF INTCPT ESV-1 LHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:47:54	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	ForcedVal Old=False New=True 2ATRS1_s By 162.
22/Feb/20 22:47:59	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:48:02	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.
22/Feb/20 22:51:09	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:51:16	2MAB20CG001BXG01	POS OF INTCPT ESV-2 RHS	ForcedVal Old=True New=False 2ATRS1_s By 162.
22/Feb/20 22:51:20	2MAB20CG001BXG01	POS OF INTCPT ESV-2 RHS	Mode Old=Normal New=Forced 2ATRS1_s By 162.
22/Feb/20 22:51:26	2MAB20CG001BXG01	POS OF INTCPT ESV-2 RHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.
22/Feb/20 22:51:28	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	Mode Old=Forced New=Normal 2ATRS1_s By 162.

MAIN	LAST
SG	TG
BOP	ELEC
GEN	TDBFP
Select Point	Track Point
PR DEV	-2.93
H2 PR	3.39
FUR PRS	-12.0
TOT COAL	256.1
TOT AIR	1582.0
SA FLOW	998.8
O2	3.51
PA HDR	793.3
DRUM PR	175.6
MS PRESS	160.4
HRH PR	38.76
MS TEMP	535.8
HRH TEMP	550.4
SH SPRAY	55.1
COND PR	0.1235
HWL LVL	-41.63
DEA LVL	246.2
DRUM LVL	13.5
MS FLOW	1310.6
FW FLOW	1342.2
COND FLW	1321.4
IA PRESS	6.45
MOT LVL	-112.7

MFT	APRDS	MILL A	MILL B	MILL C	TDBFP A	TDBFP B	EHTC	CMC	2MAB10CG001CXG02	SILENCE	TAG	Print	HW	Cond
FLAME INTENSITY	SADC	MILL D	MILL E	MILL F	TP INPIITS	LUB OIL	HPBP	VACCUM	POS OF INTCPT ESV-1 LHS	ACK	SOE	AlmSum	5.9	
BOILER					TURB.				/B-CLCS/MILL-D/B-Temperature/C-ColdAirDan	RESET			8.7	

(filtered)

11:09:34

28Feb20

9

2992RPM

463MW

UNIT 2

MAIN	LAST
SG	TG
BOP	ELEC
GEN	TDBFP
Select Point	Track Point
PR DEV	3.79
H2 PR	3.39
FUR PRS	-12.8
TOT COAL	241.0
TOT AIR	1516.7
SA FLOW	932.9
O2	3.15
PA HDR	798.4
DRUM PR	179.9
MS PRESS	164.9
HRH PR	39.62
MS TEMP	534.8
HRH TEMP	554.7
SH SPRAY	63.4
COND PR	0.1263
HVIL LVL	-13.31
DEA LVL	338.8
DRUM LVL	-7.2
MS FLOW	1346.2
FW FLOW	1386.8
COND FLW	1176.8
IA PRESS	6.45
MOT LVL	-112.3

☒ Start Time: Saturday 22/Feb/2020 22:51 ☒ End Time: Saturday 22/Feb/2020 22:53


576

Time	TagName	Description	Event Text
22/Feb/20 22:51:09	2MAB20CG001CXG02	POS OF INTCPT ESV-2 RHS	Mode Old=Normal New=Forced 2ATRS
22/Feb/20 22:51:16	2MAB20CG001BXG01	POS OF INTCPT ESV-2 RHS	ForcedVal Old=True New=False 2ATRS
22/Feb/20 22:51:20	2MAB20CG001BXG01	POS OF INTCPT ESV-2 RHS	Mode Old=Normal New=Forced 2ATRS
22/Feb/20 22:51:20.865	2RH_PROT_ACTED	LOSS OF RH PROT ACTED	Digital_State Old=False New=True 2B1
22/Feb/20 22:51:21.394	2HBK01EG200_XE52	RHP TRIP	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:21.845	2HBK01EG100_XE52	RHP TRIP	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:21.849	2HBK01EG300_XE52	RHP TRIP	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:21.859	2HBK01EA100_XU59	NO BOILER TRIP CMD	Digital_State Old=TRUE New=FALSE 2
22/Feb/20 22:51:21.894	2HBK01EZ200_XE46	MFT CH 2	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:21.905	21HBK01EZ110ZK97	TP1 MFT PROT TP CH-1	Digital_State Old=N.FAULT New=FAUL
22/Feb/20 22:51:22.238	2LBF11DP110_YN00	BP-1 VALVE FAST OPEN	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.238	2LBF21DP110_YN00	BP-2 VALVE FAST OPEN	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.345	2HBK01EZ100_XE46	MFT CH 1	Digital_State Old=MFT RESET New=MF
22/Feb/20 22:51:22.348	2HBK01EZ300_XE46	MFT CH 3	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.359	2HBK01EA105_YV00	REHEATER PROTECTION TR...	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.364	22HBK01EZ110ZK96	TP1 MFT PROT TP CH-1	Digital_State Old=N.OPTD New=OPTD 2
22/Feb/20 22:51:22.364	22HBK01EZ110ZK97	TP1 MFT PROT TP CH-1	Digital_State Old=N.FAULT New=FAUL
22/Feb/20 22:51:22.385	21HBK01EZ110ZK96	TP1 MFT PROT TP CH-1	Digital_State Old=N.OPTD New=OPTD 2
22/Feb/20 22:51:22.665	2HHA10EB100_XF05	HO TRIP COMMAND	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.738	2LBF11DP113_YN00	BP-1 VALVE	Digital_State Old=CLOSE MAN New=FA
22/Feb/20 22:51:22.744	22MAY01EZ110XE05	MFT PROT TRIPPED	Digital_State Old=FALSE New=TRUE 2

MFT	APRDS	MILL A	MILL B	MILL C	TDBFP A	TDBFP B	EHTC	CMC	21HBK01EZ110ZK97
FLAME INTENSITY	SADC	MILL D	MILL E	MILL F	TP INDIPTS	LUB OIL	HPBP	VACCUM	TP1 MFT PROT TP CH-1
BOILER	CLCC	MILL G	MILL H	MILL I	TURB.	URGE	URGE		/B-CLCS/MILL-D/B-Temperature/C-ColdAir/da

SILENCE TAG Print HW Conc

ACK SOE AlmSum 5.3

REC ET 7 =

(filtered)

11:10:25

28Feb20

9

2993RPM

457 MW

UNIT 2

MAIN	LAST
SG	TG
BOP	ELEC
GEN	TDBFP
Select Point	Track Point
PR DEV	3.10
H2 PR	3.39
FUR PRS	-13.1
TOT COAL	238.8
TOT AIR	1512.7
SA FLOW	924.9
O2	3.11
PA HDR	799.5
DRUM PR	178.7
MS PRESS	163.9
HRH PR	39.21
MS TEMP	533.9
HRH TEMP	555.0
SH SPRAY	60.2
COND PR	0.1257
HVVL LVL	6.2587
DEA LVL	329.1
DRUM LVL	0.7
MS FLOW	1324.3
FW FLOW	1380.2
COND FLW	1159.3
IA PRESS	6.33
MOT LVL	-112.3

☒ Start Time: Saturday 22/Feb/2020 22:51
 ☒ End Time: Saturday 22/Feb/2020 22:53
  576

Time	TagName	Description	Event Text
22/Feb/20 22:51:22.665	2HHA10EB100_XF05	HO TRIP COMMAND	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.738	2LBF11DP113_YN00	BP-1 VALVE	Digital_State Old=CLOSE MAN New=FA
22/Feb/20 22:51:22.744	22MAY01EZ110XE05	MFT PROT TRIPPED	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.748	BP2_GT_2_OPEN		Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.754	22MAY1EZ110GYT01	TURB TRIP CH2.1 CMD	Digital_State Old=FALSE New=ON 2TP
22/Feb/20 22:51:22.754	22MAY1EZ110HYT01	TURB TRIP CH2.2 CMD	Digital_State Old=FALSE New=ON 2TP
22/Feb/20 22:51:22.754	22MAY1EZ110JYT01	TUR TRIP CH2.3 CMD	Digital_State Old=N TRIPPED New=TRI
22/Feb/20 22:51:22.758	BP1 Malfunctiong	BP1 Valve Malfunctioning	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.758	BP1 Malfunctiong_1	BP1 Valve Malfunctioning	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.758	BP2VlvGt2Pct	BP2 VLV > 2% OPEN	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.758	BP2VlvGt2Pct_1	BP2 VLV > 2% OPEN	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.764	22MAY02EZ100	MFT RELAY OPTD	Digital_State Old=FALSE New=OPTD 2
22/Feb/20 22:51:22.810	2HFE10AN001_XB92	PA FAN-A	Digital_State Old=FALSE New=CmdSto
22/Feb/20 22:51:22.815	21MAY01EZ110XE05	MFT PROT TRIPPED	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.815	21MAY1EZ110GYT01	TURB TRIP CH1.1 CMD	Digital_State Old=FALSE New=ON 2TP
22/Feb/20 22:51:22.815	21MAY1EZ110HYT01	TURB TRIP CH1.2 CMD	Digital_State Old=FALSE New=ON 2TP
22/Feb/20 22:51:22.815	21MAY1EZ110JYT01	TUR TRIP CH1.3 CMD	Digital_State Old=N TRIPPED New=TRI
22/Feb/20 22:51:22.825	21MAY02EZ100	MFT RELAY OPTD	Digital_State Old=FALSE New=OPTD 2
22/Feb/20 22:51:22.849	2HBK01EA105_YV0...	REHEATER PROTECTION TR...	Digital_State Old=FALSE New=TRUE 2
22/Feb/20 22:51:22.851	2MAY01EZ110XT02	ETP CH-1.1	Digital_State Old=FALSE New=OPTD 2
22/Feb/20 22:51:22.887	2HFE10AN001_XB28	PA FAN-A	Digital_State Old=FALSE New=SWGRD

MFT	APRDS	MILL A	MILL B	MILL C	TDBFP A	TDBFP B	EHTC	CMC	22MAY01EZ110XE05
FLAME INTENSITY	SADC	MILL D	MILL E	MILL F	TP INPTS	LUB OIL	HPBP	VACCUM	MFT PROT TRIPPED
BOILER	CLCS	MILL G	MILL H	MILL I	TURB.	URCS	URBP		/B-CLCS/MILL-D/B-Temperature/C-ColdAirDan