

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

Dated: 06/05/2014

A committee comprising of following members was nominated by competent authority to investigate the incident of tripping of Boiler 1 due to tripping of BFW pump on 27.04.2014 AT 1750 Hours in evening shift:

- 1) Mr. C. N. Shah, JGM (Process),
- 2) Mr. S K Jha, DGM (Maint.)
- 3) Mr. Vinay Kumar, DGM (Power)

Committee immediately visited site in the morning of 28.04.2014 to get the first hand information and collected relevant documents / details required for:

- To investigate the reasons for tripping of Boiler 1 due to tripping of BFW pump on 27.04.2014 AT 1750 Hours and
- To give recommendations / suggestions to avoid reoccurrence of such failure incident in future.

1.0 Plant Condition during the failure

AFBC boiler-1 was operating at nearly full load with steam generation of about 102 MT/h. After tripping of Boiler, TG-1 was tripped and Normal power was cut off to entire complex. SAP-1 under start-up heating and DAP train C running at 90 TPH of NP (20:20:00:13) production were tripped. Action was initiated to find out the reason for BFW pump trip and to restart the boiler so that all plants can be restarted.

2.0 Failure incident investigation

Following Documents are collected to investigate the incident of tripping of Boiler 1 due to tripping of BFW pump A on 27.04.2014 at 1750 Hours in evening shift:

- Data sheet and Performance curve of the BFW pump supplied by KSB attached as Annexure-1.
- Trip logic of Boiler is attached as Annexure-2.
- Historical report of DCS alarms for boiler is attached as Annexure -3 / 3A.
- Current drawn by BFW pump A/B/C motor is attached as Annexure-4A/4B/4C.
- BFW pump-A discharge pressure (PI - 007) trend is attached as Annexure-5.
- BFW pump discharge flow (FIC-106 A) to boiler trend is attached as Annexure-6.
- Steam generation from Boiler 1 flow (FI-203 A) trend is attached as Annexure-7.
- Steam drum level (LI-102 A) trend is attached as Annexure-8.

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

- Steam Drum pressure (PI-202 A) trend is attached as Annexure-9.
- Deaerator level (LIC-001) trend is attached as Annexure-10.
- Deaerator pressure (PIC-005) trend is attached as Annexure-11.
- Deaerator make up water flow (FT-001) trend is attached as Annexure-12.
- Utility DM water transfer pump discharge flow (FI-1301) trend is attached as Annexure-13.
- Utility DM water transfer pump discharge pressure (PI-1302) trend is attached as Annexure-14.
- TG steam flow (FT-203A) & pressure (PT-096) trend is attached as Annexure-15.
- Shift log book - Boiler is attached as Annexure-16.
- Boiler control room log-sheet & field log-sheet attached as Annexure-17A/17B.
- OEM start-up procedure and BFW pump SOP as per boiler manual are attached as Annexure-18A / 18B.
- Report from Electrical Engineer along with relay setting details and reason of failure is attached as annexure-19

3.0 Failure Related documents and Sequence Event Recording by DCS

3.1 DCS alarms history record (Annexure -3)

Date and Time	Description
27.04.2014 5:48:41 PM 50LIC109A	BLW DOWN LVL CTRL PV= - 298 MMLO
27.04.2014 5:49:00 PM AN50XS010	FEED WTR PUMP1 RUN ALM (BFW PUMP A TRIP)
27.04.2014 5:49:01 PM 50PI007	BFP O/L PRESS PV=74.2 kg/cm2 LO
27.04.2014 5:49:01 PM 50PI007	BFP O/L PRESS PV=74.2 kg/cm2 LL
27.04.2014 5:49:02 PM	BOILER FEED PUMP PRESSURE LO
27.04.2014 5:49:03 PM 50FI106A	FD WTR FL TRMTR PV=44.2 TPH LO
27.04.2014 5:49:06 PM 50FIC106A	FD WTR FL TRMTR PV=20.8 TPH LL
27.04.2014 5:49:30 PM 50LI101A	DRM LVL PV= - 25.51 mm LO
27.04.2014 5:49:31 PM 50TIC205A	FNL STM TMP PV=- 505.3 DEGC HI
27.04.2014 5:49:32 PM 50LI102A	DRM LVL PV=- 25.01 mm LO
27.04.2014 5:49:43 PM 50LI103A	DRM LVL PV=- 26.94 mm LO
27.04.2014 5:50:03 PM 50LIC104A	DRM LVL CTRL PV=- 101.2 mm LO
27.04.2014 5:50:17 PM	BOILER 1 DRUM LEVEL LO
27.04.2014 5:50:19 PM BFPBON	BFPB ON PV=- ON OLD= Pump tried to start from DCS
27.04.2014 5:50:29 PM 50LI101A	DRM LVL PV= - 200.37 mm LL
27.04.2014 5:50:29 PM 50LI102A	DRM LVL PV= - 202.4 mm LL
27.04.2014 5:50:32 PM 50LIC104A	DRM LVL CTRL PV= - 200.8 mm LL
27.04.2014 5:50:32 PM 50LIC104A1E	DRM LVL CTRL PV= - 200.8 mm LL

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

27.04.2014 5:50:33 PM AN50LSLL104A DRM LVL LO TRIP

From above DCS alarm / trip summary it is evident that:

- ❖ No alarm for BFW pump over load high current has appeared.
- ❖ The Standby BFW pump C did not took start on auto (Pump tripped within 0.26 s). It was tried to start other stand by BFW pump B from DCS at 5:50:19 PM, but it did not start. It was started later on at 05.58 PM to restart the boiler.
- ❖ Steam drum low level alarm appeared at 05.49.30 PM @ PV= - 25.51 mm.
- ❖ Boiler fuel was not cut off after tripping of BFW pump A, no auto start of stand by BFW pump C and failure to start other stand by BFW pump B.
- ❖ Boiler tripped @ 5:50:33 PM on low drum level trip within 1.03 minutes of Steam drum low level alarm.

3.2 BFW pumps

- There are three KSB make BFW pumps each with capacity of 129 m³/h with discharge head of 861 m (Discharge Pressure: 82.21 kg/cm²g) for two AFBC boiler (capacity: 110 MT/h). With two boilers in operation, two BFW pump remain in service and one BFW pump as emergency standby with a provision to start on auto at low BFW pump discharge pressure (< 73 kg/cm²g).
- BFW pumps supply water for steam drum, attemperator for steam de-superheating in boiler and 4" line to Energy Center for steam de-superheating.
- As Boiler-2 was under plant turn around for revamping, only one boiler was in operation and BFW pump A was in line with other two pumps as standby.

3.2.1 Current drawn by BFW pump A/B/C motor (Annexure - 4A / 4B / 4C)

- BFW pump A was running and BFW pumps B and C where standby.
- At about 05.45 AM on 27.04.2014, current drawl by BFW pump A was increased from about 37 – 38 Amp to about 44 Amp. No action was taken by boiler to know the reason or inform Electrical to avoid over load tripping.
- At 0711 hours and 0934 hours, current draw of BFW pump A had reduced and again increased to 44 Amp level within 15 minutes. This was due to auto start of the BFW pump C on low BFW pressure as shown below and in the DCS alarm summary (**Annexure -3A**):

27.04.2014 7:09:17 AM	BOILER FEED PUMP PRESSURE LO
27.04.2014 7:09:43 AM 50PI007	BFP O/L PRESS PV=74.5 kg/cm² LL still
27.04.2014 7:11:59 AM AN50XS012	FEED WTR PUMP3 RUN NR (BFW PUMP C Auto start)
27.04.2014 9:32:47 AM	BOILER FEED PUMP PRESSURE LO
27.04.2014 9:34:25 AM 50PI007	BFP O/L PRESS PV=73.3 kg/cm² LL still

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

27.04.2014 9:34:55 AM AN50XS012 FEED WTR PUMP3 RUN NR (BFW PUMP C Auto start)

- At 1630 hours and again at 1645 hours utility DM water pump was tripped because of electrical problem (due to power shortage, utility pumps were on emergency power. MCC breaker in utility substation where DG supply is coming tripped). Boiler load was reduced and BFW pump A current drawl was reduced and it again increased to about 44 Amp level after 1715 hours.
- There was no alarm for high current drawn by BFW pump A. At 1748 hours when it tripped, current drawl was 45 Amp. As per the electrical report based on relay for BFW pump A, it tripped on thermal over load within 1856080 m seconds (30.93 minutes). Over load trip set value for BFW pump A is 95 % of full load current of 44 Amp.
- BFW pump C was on auto start mode. As per the electrical report based on relay for BFW pump C, it tripped on over load due to earth fault within 0.26 seconds of auto start. The above incident did not appear in the DCS alarm summary may be due to DCS data scan time of 1 second. Over load trip set value for BFW pump B & C is 90 % of full load current of 44 Amp.
- BFW pump B was standby on MANUAL mode in DCS. Hence, it did not start on AUTO on tripping of BFW pump C. It was tried by panel in-charge to start BFW pump B from DCS at 05:50:19 PM, but it did not start and boiler tripped at 05:50:33 PM on low drum level. This may be due to in MCC feeder would have been in LOCAL mode instead of in REMOTE mode.
- BFW pump B was started at 17.58 hours as seen from the current draw trend.
- BFW pump C was started at 19.02 hours as seen from the current draw trend.

3.2.2 BFW pump-A discharge pressure trend (Annexure -5)

- ✓ Before 16.24 hours, BFW pump A discharge pressure was less than 77 kg/cm²g.
- ✓ As mentioned in 3.2.1 above, BFW pump C had started on auto in morning shift twice at 07.11.59 and at 09.34.55 due to low pressure. With two BFW pumps running, BFW pressure had increased to about 88 kg/cm²g. The auto start of the BFW pump C on low discharge pressure was may be due to reduction in BFW pump discharge pressure due to sudden drawl of BFW for little load increase and in energy center for steam de-superheating in PRDS.
- ✓ BFW pump AUTO start on low BFW pressure is set at < 73 kg/cm²g.

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

- ✓ As per the pressure trend, on tripping of BFW pump A BFW pressure started reducing at 17.48 hours from 77.2 kg/cm²g and reduced to 3.6 kg/cm²g at 1750 hours. Pressure trend does not show start up of the stand by pump.
- ✓ BFW pump discharge flow as per pump curve at 77.2 kg/cm²g (808 m head) will be more than 145 m³/h and BKW of > 400 kW.
- ✓ BFW pump B was started at 17.58 hours and BFW pressure was 87.8 kg/cm²g at 1800 hours.

3.3 BFW pump discharge flow to boiler drum trend (Annexure -6)

- From morning 0800 to 1630 hours (before utility DMW pump tripping due electrical problem), the BFW pump discharge flow to steam drum was varying between 102 to 108 m³/h.
- There is no flow meter for BFW flow to attemperator and for 4" BFW line to Energy Center.
- At 1630 hours and again at 1645 hours, due to tripping of utility DM water pump because of electrical problem in Utility substation, boiler load was reduced and BFW flow to drum at 1640 hours was about 64 m³/h.
- At 1716 hours boiler load came to normal and BFW flow to steam drum was varying between 95 to 102.4 m³/h.
- Before tripping of BFW pump, BFW flow increased to 102.4 m³/h to meet the increased boiler load for meeting the steam demand of plants. This along with more flow to Energy Center can be the reason for overload of the pump.
- At 1748 hours boiler tripped and BFW flow reduced from 102.4 m³/h to zero at 17.50 hours.
- BFW pump B was started at 17.58 hours as shown by the BFW flow trend and flow to drum was 107 m³/h at 1804 hours.
- BFW flow was varying from zero to more than 100 m³/h during boiler restart and stabilization period from 1758 hours to 1928 hours, may be due to manual flow control.

3.4 Steam Flow from Boiler A (Annexure -7)

- From 0800 to 1630 hours (before utility DMW pump tripping due electrical problem), the Steam flow from boiler-1 was varying between 100 to 106 MT/h.
- Due to tripping of DM water pump from utility, at 1638 hours boiler load was reduced to 65.6 MT/h. Same was again increase to 100.8 hours at 1712 hours and it was varying between 99 to 106.6 MT/h at 1750 hours (time of boiler-1

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

tripping due to low drum level). Boiler steam load was not reduced after tripping of BFW pump.

- Boiler was again restarted and at 1840 hours boiler-1 load was 61.9 MT/h.

3.5 Steam drum level trend (Annexure -8)

- a) Steam drum water level was maintained at normal level till 1630 hours (before utility DMW pump tripping due electrical problem).
- b) At 16.32 hours, drum level was - 15.66 mm and at 16.54 hours, level was - 69.53 mm. Low drum level was may be due to utility DMW pump tripping, which was made normal at 16.58 hours (drum level: 86.36 mm) after restart of the DMW pump. Drum level controller shall be maintained in auto except during plant start-up to avoid the tripping of boiler at low steam drum level.
- c) From 1658 to 1748 hours i.e. till tripping of BFW pump A, drum level was normal. Steam drum level immediately started reducing on tripping of BFW pump A at 17.48 hours and boiler tripped at 1750 hours. Drum level reduced to - 400 mm at 1752 hours.
- d) To restart the boiler, steam drum filling was started at 1802 hours with BFW pump B.

3.6 Steam Drum pressure trend (Annexure -9)

- Drum pressure was normal before boiler tripping. Just after boiler trip steam drum pressure had increased to 70.5 kg/cm²g against normal drum pressure of 68.4 kg/cm²g.
- After tripping of boiler, at 1752 hours Drum pressure started reducing from 70.5 kg/cm²g and reduced to 35.4 kg/cm²g at 1810 hours. With start-up activities of boiler, drum pressure started increasing and at 1822 hours it was 62.3 kg/cm²g.

3.7 Deaerator level trend / Deaerator make up water flow trend and Utility DM water transfer pump discharge flow (Annexure – 10 / 12 / 13)

- Trend of the Deaerator level indicate that BFW pump A had not tripped on low Deaerator level.
- Deaerator level had reduced to - 203 mm when utility DM water pumps had tripped at 1630 hours. The BFW pump trip set value is -1180 mm level from centerline of Deaerator (1880 mm below normal level).
- DM make up water flow to Deaerator was nearly steady before 1618 hours before tripping of the utility DMW pump.

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

- Before and after tripping of boiler, DM water makeup flow was fluctuating may be due to manual control of the Deaerator level control.

3.8 Steam flow and pressure to TG trend (Annexure-15)

Trend of steam flow to TG indicate that TG was tripped manually due to low steam pressure and flow at 1750 hours and activities started for restating the TG at 1820 hours after restart of boiler.

3.9 Log book of Shift in charge / Control room / Field Operator: (Annexure -16 / 17A / 17B)

- ❖ There is no mention in the log sheet / log book about auto start of BFW C pump in morning shift on low BFW pressure at 7:11:59 AM and at 9:34:55 AM.
- ❖ With low BFW pressure (PV=74.5 kg/cm²g) at 7:09:43 AM, BFW PUMP C Auto start at 7:11:59 AM (within 2 minutes and 16 second of low pressure alarm). Again with low BFW pressure (PV=73.3 kg/cm²g) at 9:34:25, BFW PUMP C Auto start at 9:34:55 AM (within 20 second of alarm). No mention of verification of BFW low pressure, possible reason for BFW low pressure and details of BFW C pump stopping in log sheet.
- ❖ There is no record / mention in log book for failure to AUTO start of BFW pump C on trip of BFW pump A, efforts to start BFW B pump, Activities for restating of boiler i.e. checking of trip system of boiler, starting of FD fan, BFW pumps, boiler light up etc.
- ❖ There is no record of TRIP system check before boiler restart for previous start-ups and that after tripping of boiler on 27.04.2014.
- ❖ There is no record for checking of BFW pump auto start on low BFW pressure.
- ❖ In morning shift and evening shift on 27.04.2014, only two set of readings are filled in control room log sheet. In field log sheet even though BFW pump A was tripped at 17.48 hours, reading for BFW pump A are filled for 1800 hours. Present practice is to log only three set of readings in a shift in control room log sheet. There is no printing and record keeping of DCS log sheet.
- ❖ Log sheet does not include all critical parameters for all major equipments.

4.0 Testimony statements

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

Following Personnel of boiler operation, Instrumentation, Electrical present in shift and responsible for operation and maintenance were interviewed to know the actual happening about the BFW pump A trip and boiler trip on 27.04.2014.

4.1 Mr. T R Yadav, Mgr (Boiler), Mr. Tushar K Bhoi, Dy. Mgr (Boiler) & Shift In charge, AFBC Boiler, Mr. Rajkumar Viswakarma, AM (Boiler) & Panel in-charge, S Rizvi, field Operator

- ✓ The boiler-1 was running at 102 MT/h steam load with BFW pump A in line and BFW pump B & C as standby.
- ✓ The boiler tripped due to tripping of BFW pump A on over load, may be due to over drawl of water by energy center and BFW pump C did not start on auto even though it was kept on auto start mode.
- ✓ It was tried to start BFW pump B from DCS but could not start it.
- ✓ Field operator tried to start BFW pump A and BFW pump C from field but could not start as both pumps had tripped on over load. Field operator could not start BFW pump B field as the lever of the LCS is missing / broken.
- ✓ BFW pump B was started at 15.58 hours from DCS to restart the boiler.
- ✓ Boiler was not tripped by panel in-charge. It got tripped at 05:50:33 PM on low steam drum level.
- ✓ They immediately informed and called Electrical and Instrument Engineers.

4.2 Mr. D P Hota, Dy. Manager (Elect.), AFBC Boiler – Electrical,

- ✚ On 27/04/2014 BFP-A, ID-1A & ID-1B, FD-1A & FD-1B of Boiler-1 were running while BFP-B & BFP-C in OFF condition.
- ✚ At 5:49 PM while Boiler-1 was delivering 102 MT/h steam and BFP-A motor tripped on Overload. The Full load current of BFP motors is 44 Amp. The adopted O/L setting in BFP-A is 95 % of FLC (i.e. 41.8 Amp) with a 10 min IDMT curve. The motor was run over the O/L set value for a long period. The protection functions, their set values and the event list of fault occurrence of BFP-A motor is given in **Annexure-19**.
- ✚ BFW Pump A is a new pump installed in June-2013, which is delivering more flow & discharge pressure compared to other two BFW pumps B /C resulting in more current drawn by the motor. Due to this, the O/L setting of the motor of BFW Pump A was increased from 90 % to 95 %.
- ✚ Immediately after tripping of BFW Pump -A, BFW Pump-C, which was in AUTO logic mode in DCS, started due to low discharge pressure. BFW Pump

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

C also tripped on high initial starting current within 0.26 seconds due to earth fault. The protection functions, their set values and the event list of fault occurrence of BFP-C motor are given in **Annexure-19**.

✚ BFP-B which was in MANUAL mode in DCS was started manually.

✚ For the protection of the motors, a microprocessor based 7sj600 relay used with several inbuilt protection functions. The current drawn by the motor is monitored by the different parameter/functions of the relay. Depending upon the set value of current, the respective functions initiate & follow the respective curve and give a trip command with time delay.

4.3 Mr. S P Rath, Manager (Inst.), Mr. Biswajit Mondal, Dy. Manager (Inst.), Mr. Sunil Bansode, Dy. Manager (Inst.),

- BFW pump C had started on auto in morning shift twice at 07.11.59 and at 09.34.55 due to low BFW pressure. Same was recorded in the DCS alarm summary attached at Annexure-3A.
- BFW pump C was on auto start mode. As per the electrical report based on relay for BFW pump C, it tripped on over load due to earth fault within 0.26 seconds of auto start. The above incident did not appear in the DCS alarm summary may be due to DCS data scan time of 1 second.
- BFW pump C was on AUTO start mode and BFW pump B was on manual mode.
- Boiler tripped at 05:50:33 PM on low drum level.
- Instrumentation will give print out for DCS alarm / trip summary and trend for all the relevant parameters.
- Many DCS IOP alarms are appearing in the DCS alarm summary. Same will be rectified by Instrumentation.

5.0 Reasons for tripping of the BFW pump and Boiler

5.1 BFW pump A (Pump in operation)

At 1748 hours when current drawl by BFW pump A was 45 Amp, it tripped. As per the electrical report based on relay for BFW pump A, it tripped on thermal over load within 1856080 m seconds (30.93 minutes). Over load trip set value for BFW pump A is 95 % of full load current of 44 Amp.

5.2 BFW pump C (standby pump on AUTO start logic mode)

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

BFW pump C was on auto start mode. As per the electrical report based on relay for BFW pump C, it tripped on over load due to earth fault within 0.26 seconds of auto start. The above incident did not appear in the DCS alarm summary may be due to DCS data scan time of 1 second. Over load trip set value for BFW pump B & C is 90 % of full load current of 44 Amp.

5.3 BFW pump B (standby pump on manual mode)

BFW pump B was standby but not on auto start mode. Hence, it did not start on tripping of BFW pump C. It was tried by panel in-charge to start BFW pump B from DCS at 05:50:19 PM, but it did not start and boiler tripped at 05:50:33 PM on low drum level. This may be due to in MCC, feeder would have been in LOCAL mode instead of in REMOTE mode.

5.4 Boiler-1

Boiler got tripped at 5:50:33 PM on low steam drum level.

6.0 Recommendations by committee

1. In case of BFW pumps failure, boiler shall be tripped to avoid steam drum dry-out.
2. AS per OEM and SOP for BFW pump operation, it shall be started with discharge valve fully closed. Presently, discharge valve of the standby pumps is kept full open. It is recommended that Auto start pump discharge valve to be throttled to keep about 10 % open to avoid over load trip in case of auto start of the pump. Discharge valve shall be opened gradually only after pump achieves full speed and current stabilizes.
3. It shall be made a practice to check all trip logics and keep its record during cold start of the boiler. Presently there is no practice for trip logic checking.
4. It shall be made practice to check stand by pump auto start operation every fortnight and record of same shall to be maintained.
5. As per present logic for BFW pump auto start, only one pump can be kept on AUTO start logic and other pump will be on MANUAL mode in DCS. Logic for auto start of stand by pumps shall be modified such that both BFW pump shall have provision to auto start serially one by one. If after 30 seconds of AUTO start of first pump, BFW pressure is not achieved above min. required BFW pressure of 73 kg/cm², second standby BFW pump will also start on AUTO.

**REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING
OF BFW PUMP ON 27.04.2014 AT 1750 HOURS**

6. BFW pumps over load trip set value for BFW pump A is 95 % of full load current of 44 Amp. (41.8 Amp) and for BFW pumps B and C is 90 % of full load current of 44 Amp. (39.6 Amp). For flexibility in plant operation, Electrical shall review of keep overload trip setting value at 1.05 time full load current.
7. DCS alarm to be generated / provided for alerting panel in-charge for high current, low BFW pump discharge pressure etc. and increase to be reviewed. HT Motor over load trip set value increase to be reviewed.
8. FI to be installed for BFW flow to attemperator and to Energy Center.
9. BFW Pump discharge pressure low alarm to be set at 79 kg/cm²g (BFW flow as per curve: 140 m³/h) to alert panel operator for avoiding over loading of BFW pump motor.
10. BFW flow was varying from zero to more than 100 m³/h during boiler restart and stabilization period from 1758 hours to 1928 hours, may be due to manual flow control. There was Boiler drum level to be put on auto once steam generation load comes to 50 % of rated capacity.
11. The log sheet data for control room and field log sheet shall be filled two hourly. All major incidents in the plant / imp alarm / trip shall be mentioned in the log sheet with time along with reason for the same and action taken etc.
12. Presently the DCS log sheet is not printed. DCS log sheet shall be made for record keeping of hourly / two hourly readings in soft copy. Action to be made for preserving date wise two hourly DCS data in soft copy. Monthly day wise DCS data storage to be started for all plants (DAP/SAP/PAP/Boiler/Energy Center/Ammonia Storage/DM plant).
13. For BFW pump auto start condition of low BFW flow @ 55 m³/h shall also be included in addition to low pump discharge pressure of < 73 kg/cm²g.

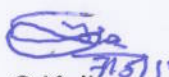
S K Jha
DGM (Maint.–DAP)


Vinay Kumar
DGM (Power)

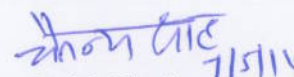
C. N. Shah,
JGM (Process)

REPORT ON TRIPPING OF BOILER – 1 DUE TO TRIPPING
OF BFW PUMP ON 27.04.2014 AT 1750 HOURS

6. BFW pumps over load trip set value for BFW pump A is 95 % of full load current of 44 Amp. (41.8 Amp) and for BFW pumps B and C is 90 % of full load current of 44 Amp. (39.6 Amp). For flexibility in plant operation, Electrical shall review of keep overload trip setting value at 1.05 time full load current.
7. DCS alarm to be generated / provided for alerting panel in-charge for high current, low BFW pump discharge pressure etc. and increase to be reviewed. HT Motor over load trip set value increase to be reviewed.
8. FI to be installed for BFW flow to attemperator and to Energy Center.
9. BFW Pump discharge pressure low alarm to be set at 79 kg/cm²g (BFW flow as per curve: 140 m³/h) to alert panel operator for avoiding over loading of BFW pump motor.
10. BFW flow was varying from zero to more than 100 m³/h during boiler restart and stabilization period from 1758 hours to 1928 hours, may be due to manual flow control. There was Boiler drum level to be put on auto once steam generation load comes to 50 % of rated capacity.
11. The log sheet data for control room and field log sheet shall be filled two hourly. All major incidents in the plant / imp alarm / trip shall be mentioned in the log sheet with time along with reason for the same and action taken etc.
12. Presently the DCS log sheet is not printed. DCS log sheet shall be made for record keeping of hourly / two hourly readings in soft copy. Action to be made for preserving date wise two hourly DCS data in soft copy. Monthly day wise DCS data storage to be started for all plants (DAP/SAP/PAP/Boiler/Energy Center/Ammonia Storage/DM plant).
13. For BFW pump auto start condition of low BFW flow @ 55 m³/h shall also be included in addition to low pump discharge pressure of < 73 kg/cm²g.


S K Jha
715114
DGM (Maint.-DAP)


Vinay Kumar
DGM (Power)


C. N. Shah,
715114
JGM (Process)

