PURPOSE: To define SOP for Motor Driven Boiler Feed Pump Operation

SCOPE: This SOP is applicable at NTPL

RESPONSIBILITY: Shift Engineer / Operation Engineer

PERFORMANCE CRITERIA:

ACTIVITIES:

BFP: Local Operation

Feed Water Charging of BFP:

- Ensure that Suction, Discharge, Discharge bypass and Re circulation valves are in Close condition initially.
- Close All Drains. (Suction Strainers) / Discharge NRV after drain)
- Open All Air vents. (BP casing/MP casing-2nos)
- Open Suction Valve slightly from local.
- Close all air vents after air releasing and Open Suction Valve fully from UCB.
- Open RC valve
- Observe for Suction and Discharge pressure readings after pump charging.

Feed Water Charging of HP Heaters upto Feed Water Control Station:

- Keep HPBP Spray manual valve at 8.5 ML / All FCVs / All SH Spray Valves Closed, if necessary (under LC).
- Keep the top most vent at Feed Water Control Station Open.
- Keep Inlet / Outlet atmospheric drains Closed, Inlet / Water Box Drains Closed and Inlet / Outlet Water Box Air Vents Open for all HP Heaters.
- For HP heaters of both side, open bypass valve of I/L and O/L valve for charging.
- Open Discharge valve of one of the BFPs and Gravity Charge the Feed Water Line upto the Feed Water Control Station at the Boiler side and Close Discharge valve afterwards.
- Once water comes out of heaters vents, close all vents and full open I/L and O/L valves.

Local Checking

- Ensure Suction valve is Open, Discharge valve and its bypass are Closed and the Recirculation valve is Open at Local.
- Ensure DMCW inlet / outlet valves are Open, individual manual valves to Booster pump jacket cooling, Motor Coolers, BFP jacket coolers and Seal water coolers, Working Oil / Lube Oil Coolers are all in Open condition.
- Release the Local latch and inform UCB to start the pump.

BFP Starting

- Ensure adequate level in the Deaerator storage tank. (> 0 mm)
- No related LCs are pending and equipment supply is available.
- Start LOP and watch lube oil/ Working oil pressure, bearing temperatures, Working Oil/Lube Oil temperature readings.
- Ensure that LOP is running, the Oil header pressure and Filter DP are normal. Observe Oil flow through all Oil return line view glasses.
- Look for any abnormal Water or Oil leaks in the system.
- Ensure for full Open of Suction Valve, Recirculation valve and closed condition of Discharge Valve.
- Keep Scoop in 0 position and check for all starting permissive.
- Ensure power supply for the pump and after getting clearance from the local personal, give start command and rise the scoop to 20 %(minimum required)
- Check auto opening of Motor cooler MOV@ 0ML
- Observe for any abnormal noise/vibration in the running equipments.
- Observe Oil pressures/ Suction & Discharge pressure/ Bearing temp at the local panel.
- Watch recirculation flow through the pump. Open the Discharge Valve integral bypass valve(IBV) and close the Air Vent at FWC Station.
- Watch Bearing Temperature rise, Oil pressure/temperature, Winding temperature of motor, Suction filter DP.
- Open Discharge valve once the pump pressure is equal to the BFD line pressure.
- For initial operation use 30% line for controlling Drum level. At a Drum pressure of > 80 ksc., change to 100 % line and isolate 30% line.

	MDBFP Start Permissive	MDBFP Protections
1	[AOP ON AND Lube oil press. > 2 ksc 2/3] AND	MDBFP ON for 30s AND Corrected speed is more than suction flow (<-50 tph)
2	MDBFP Suction valve open AND	MDBFP suction flow low (< 200 tph) TD15s
3	D/A level not low (> -580 mm) 2/3 AND	HC lub oil header press. very low (< 0.8 ksc) 2/3 TD 3 s
4	Working oil temp. upstream clrs < 110 degc 2/3 AND	HC working oil temp very high (>130 degc) 2/3 TD 10 s
5	Working oil temp. downstream clrs < 75 degc AND	HC working oil press very low (<2.2 ksc) 2/3 AND MDBFP ON, TD 5s
6	HC lub oil temp down stream clrs < 55 degc 2/3 AND	MDBFP suction valve not open
7	Barrel casing top / bottom DT < 22 degc AND	1.MDBFP suction & discharge DT >15 degc 2/3 AND 2.MDBFP ON AND 3. 1Suction – speed< -50 TPH OR [Speed sensor fault AND Suction flow <100 TPH] AND 3.2 MDBFP ON 5 min
8	MDBFP journal bearing temp < 90 degc AND	Lub oil temp. downstream clr very high (> 60 degc) 2/3 TD 2s
9	MDBFP thrust bearing temp < 100 degc AND	MDBFP journal bearing temp very high (> 95 degc) TD 2s
10	Hydraulic coupling bearing temp < 90 degc AND	MDBFP thrust bearing temp. very high (>105 degc) TD 10 s
11	MDBFP motor journal bearing temp < 85 degc AND	MDBFP motor winding temp very high (>130 degc)
12	MDBFP motor winding temp < 125 degc AND	D/A level very low (< -1610 mm) 2/3
13	SWGR. Available AND	MDBFP motor journal bearing temp very high (> 90 degc) TD 2 s
14	SWGR. Not disturbed AND	Hyd. coupling bearing temp very high (> 95 degc) TD 10 s
15	Booster pump journal bearing temp < 90 degc AND	Booster pump thrust bearing temp very high (> 105 degc)
16	Booster pump thrust bearing temp < 100 degc AND	Booster pump journal bearing temp very high (> 95degc)
17	MDBFP FW Discharge / Suction DT < 10 degc AND	Electrical protection acted
18	MDBFP CW header press. > 3 ksc AND	Suction pressure low <10 ksc TD (20+15) s
19	MDBFP HC tank level not low AND	Barrel temperature Top/Bottom DT high >22 deg.C
20	MDBFP HC tank level not high AND	Brg. Vib. High>18(4 elements)
21	MDBFP Recirculation Valve open AND	MDBFP ON for 30s AND Corrected speed is more than suction flow (<-50 tph)
22	MDBFP CW(43) Valve close AND	MDBFP suction flow low (< 200 tph) TD15s
23	[[MDBFP discharge v/v AND IBV Close] OR MDBFP Standby Selected] AND [[MDBFP Rapid Start Up Solenoid SOV92 AND SOV93 ON AND Scoop position min. (0%)] OR Hyd. coupling min/cls (<2%)] AND	
24	[MDBFP not in standby OR Reverse Rotation not acted(Suc pr >35)]	

25	MDBFP OFF	
26	WO Pressure Adequate >2.8 ksc	
27	MTO OPT	

RECORDS:

Record Title	Record No.	Location	Responsibility	Retention Time

VERIFICATION, CORRECTIVE AND PREVENTIVE ACTION:

HOD shall ensure adequacy and implementation of the above procedure through periodic interaction with department personnel, and regular review and monitoring of the processes and compliances. In case of any observed deviation, corrective and preventive action shall be immediately undertaken.

HOD