

APPENDIX 5: BABCOCK & WILCOX MILLS

TASK: BALL CHANGE ("A, B & C" SERVICES)

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Mzwakhe Simelane 

SERVICE ACTIONS

"A, B & C" SERVICE BALL CHANGE

MILL PARTICULARS	
UNIT:	
MILL:	
DATE: a)	SERVICE ISSUED :...../...../.....
b)	SERVICE COMPLETE:...../...../.....
c)	SERVICE RETURNED:...../...../.....
RUNNING HOURS: a)	MILL TOTAL:h
	G/BOXhrs
b)	RINGS: (i) TOP:h SER NO.
	(ii) BOTTOMh SER NO.
c) BALLS:h	
d) TO NEXT SERVICEh	
e) SERVICE HOURSh	
MILL WEAR RATE: RINGS	TOP HRS/mm
	BOT HRS/mm
	BALLS HRS/mm
NUMBER OF BALLS	HRS/mm

SERVICE ACTIONS

1. Serial numbers of major components

- 1.1. Mill Gearbox
- 1.2. Mill Motor
- 1.3. Feeder Gearbox
- 1.4. Feeder Motor
- 1.5. Bottom & Top Ring
- 1.6. Balls (new 985mm balls only).

2. GRINDING BALLS

- 2.1. Crack test each ball in turn by tapping with a hammer, ball must have a ringing sound.
- 2.2. Record existing / removed ball sizes.
- 2.3. Record fitted ball sizes.

3. GRINDING RINGS

- 3.1. Examine rings for cracks, chipping or abnormal wear. For further action report findings to Supervisor.
- 3.2. Take dimensions "A" and "C" of the rings in use as shown on diagram for both the top and bottom rings.

If the ring thickness is less than 45mm, NO BALL CHANGE IS PERMITTED.

4. CLASSIFIER & DISCHARGE DUCTING

- 4.1. Check classifier cone and repair if required.
 - 4.1.1. Angle should be [Unit 1 37.5° Unit 2 37° Unit 3 37° Unit 4 36° as of March 2000].
 - 4.1.2. Use profile gauge to check angles.
- 4.2. Check skirts and repair if required.
- 4.3. Check inner cone and repair if required.

- 4.4. Check the classifier vanes for erosion and the vane spindles for wear. Make sure the vanes are adjusted to the settings obtained from performance monitoring department.

5. SPIDER

- 5.1. Check the ball and socket coupling connecting the loading rams to the top ring spider plates. The clearance "X" must not be less than 6mm. If clearance is less, the coupling must then be renewed. Clean out the coal from under ball before measuring. If pins are broken, renew pins.

NOTE: Pins must always be more than half way into slot to prevent RAM from rotating.

- 5.2. Measure the thickness of all spider wear plates. If the guides are less than 25mm thick, all the plates must be renewed.
- 5.3. Measure the thickness of the Mill guide plates, and if there is a significant step on the leading wear plate it must be turned or renewed to have a smooth surface.
- 5.4. Use chain block to ensure all four (4) spider head leading side wear plates are tight against mill plates. Measure all four (4) trailing end gaps. Gaps must be 10mm.

6. LOADING RAMS

- 6.1. Check bellows for perishing and renew if required.
- 6.2. Retention on all bellows.
- 6.3. Both filters on system to be cleaned.
- 6.4. System to be pressure tested and all leaks repaired (gas and oil).

7. YOKE

- 7.1. Measure the gap between the yoke and bottom ring through the reject brush inspection door at places provided. Turn table clockwise and count position 1 as first position after table key. If gap is more than 0,4mm, inform your Supervisor for action to be taken.
- 7.2. Inspect sealant between yoke and bottom ring.

8. MILL BODY

- 8.1. Check that all bolts and nuts inside and on Mill body are tight and check that all the locking arrangements on the nuts are intact.
- 8.2. Check for damaged or broken components and renew if required.
- 8.3. Check Mill body liner plates for wear and renew where required.
- 8.4. Check and tighten the Mill foundation bolts.
- 8.5. Check throat plates for wear and cracks, renew if required.
- 8.6. Check all compensators for any leaks.
- 8.7. Clean slots from coal build up.
- 8.8. Measure throat area and alter to be within limits ($0,59 \text{ m}^2 \leq \text{area} \leq 0,61 \text{ m}^2$).
- 8.9. Measure the spider guide gaps. If the gaps are more than 12mm all the wear plates are to be renewed, turned or swooped and shimmed at the trailing spider wear plates to a minimum clearance of 8mm. Ensure that all four spider arms are in contact on the leading side.
- 8.10. Check cladding and lagging.

9. REJECT SYSTEM

- 9.1. Check condition of relief gate and seal pipes.
- 9.2. Check the condition of the reject brush ploughs and renew if required.
- 9.3. Check brush carrier securing boltholes, if worn renew carrier.
- 9.4. Measure the clearances between the brushes and reject chamber liner plates. The brushes are to be renewed/readjust if gap is more than 50 mm.
- 9.5. Check the reject box inspection door gaskets and renew if required.
- 9.6. Check reject box inner door for correct operation and the spindle gland and repack if required.
- 9.7. Check reject door indicator.
- 9.8. Check reject line and renew or replace sections where necessary. (DO NOT PATCH LINE)
- 9.9. Check the jet pulsion pump isolating valve for correct operation.
- 9.10. Remove the valve spindle extension and install a grease stick. Operate and check the valve for correct operation.
- 9.11. Check the water seal drain valve for correct operation and repair if required.

- 9.12. Remove the water seal drain plug and clean out the water seal. Replace the drain plug ensuring that it will not leak.
- 9.13. Overhaul jet pulsion pump if not functioning properly.

10. GEARBOX

- 10.1. Remove the bibby coupling guard and open the coupling springs. Clean off all the grease and remove the springs. Inspect the springs and coupling for wear and renew if required.
- 10.2. Measure the gap between the couplings and check the alignment at four places. Re-align motor to gearbox if required. If the alignment is out and the gearbox has moved, inform the Supervisor immediately before re-aligning the motor. (THE ASSISTANT SUPERVISOR IS TO CHECK ALIGNMENT BEFORE THE COUPLING IS BOXED UP).
- 10.3. Ensure that the gearbox seal grease nipples are open and inject 0,5 kg grease into the labyrinth seal and fill the automatic lubricator on the input shaft seal with BP Energol LS 3.
- 10.4. Clean and check the lubricating oil filters. If any metal particles are found inform your Supervisor.
- 10.5. Measure the backlash on the input shaft coupling.
- 10.6. Inspect gear lubricant nozzles for functioning.
- 10.7. Inspect oil cooler and pipework for any leaks.
- 10.8. Check the oil level and top up if required.

11. MILL SUMP

- 11.1. Check the Mill foundation springs and report any abnormalities to your Supervisor.
- 11.2. Inspect gerb dampers and repair if necessary.
- 11.3. Check the sump pump for correct operation.

12. COAL FEEDER

- 12.1. Check the clearance between the coal inlet chute side skirting and the upper surface of the belt. The clearance must not exceed 8mm. Re-adjust if required, to 6mm. **NOTE: 6mm Gap at leading edge and 8mm at trailing edge.**
- 12.2. Renew side skirting if worn out.
- 12.3. Measure feeder loading bar distance as shown on diagram. A tolerance of 1 mm is allowed on 135mm and if distance is larger re-adjust distance to 135mm. (Profile area to be $0,072\text{m}^2 \pm 0,001$).
- 12.4. Check the coal flow and discharge alarm paddle for erosion and freedom of movement and replace or repair if required.
- 12.5. Check all feeders bearing grease pipes and seals. Renew if required.
- 12.6. Check the feeder belt tension. The tension is correct when the grease nipple on the tension roller is opposite the centre mark on the indicator plate. Re-adjust tension if required.
- 12.7. Check feeder gearbox oil level, top up if necessary.
- 12.8. Side skirtings to inspect and thickness to be taken. If less than 2,5mm – review.
- 12.9. To tension the feeder belt, carry out the following procedure:
 - 12.9.1. Set the two counters, situated one on each side of the access door, to Zero.
 - 12.9.2. Adjust the belt tension by turning the take-up screw in a clockwise direction. **NOTE: DO NOT TURN ANY ONE OF THE TENSION NUTS MORE THAN FOUR TURNS AT A TIME.**
 - 12.9.3. The counter readings must always be the same after both the tension nuts have been turned any time.
 - 12.9.4. Measure the sag of the clean out conveyor chain and if necessary, adjust the sag by turning the tension nuts. The sag should not be more than 3% of the centre distance between the drive sprocket and driven sprocket.
 - 12.9.5. Check the chain support plates at both ends of the conveyor for wear and renew if necessary.
 - 12.9.6. Check the clean out conveyor for wear or stretching and repair if required.
 - 12.9.7. Inspect feeder table for wear.
 - 12.9.8. Use spring washers when replacing the back plate.
 - 12.9.9. Inspect clean out conveyor drive bushes and shearing pin.

NOTE: DO NOT ATTEMPT TO DO ANY WORK INSIDE THE FEEDER ONCE THE PERMIT HAS BEEN CLEARED.

- g) The feeder belt has a guide ridge running along the centre of the underside of the belt. The ridge runs in a groove in the pulley and should the tracking of the belt be

incorrect, the guide ridge will move out of the groove and a hump will appear on the upper surface of the belt.

- h) Via agreed communications ask the appointed person to run the feeder belt at slow speed for at least 10 revolutions of the belt. Check the general condition of the belt and look for signs of humping at the head and tail pulley. If intermittent humping is seen, it could be as a result of a build-up of coal dust in the pulley grooves. Therefore, first check and clean the pulley grooves before attempting to correct the tracking.
- i) If no humping occurs at slow speed, ask for the belt to be run at high speed. Again check the head and tail pulley for humping.
- j) If the belt is humping at slow or high speed and the pulley grooves are clean, adjust the tracking.
- k) Tracking the Feeder Belt
- n) To track the head pulley, increase the tension of the take-up screw on the same side of the feeder, towards which the belt is required to move. Take care not to over adjust the tracking.
- p) To track the take-up pulley adjust the tension pulley setting on the opposite side of the feeder, towards which the belt is required to move. Take care not to over adjust the tracking.

NOTE: AFTER TRACKING BELT ON ONE PULLEY ALWAYS CHECK THE TRACKING ON THE OTHER PULLEY.

- q) After all tracking adjustments have been made, ask for the belt to be run at fast speed and finally check the tracking.
- r) When checking the belt for final tracking, also check the clean-out conveyor for worn links and broken scraper blades.

**NOTE: IF ANY REPAIRS ARE NECESSARY ON THE CLEAN-OUT CONVEYOR,
REQUEST THE RESPONSIBLE PERSON TO RE -APPLY FOR A PLANT
ISOLATION PERMIT ON THE FEEDER.**

13. RAW COAL PIPES

- 13.1. Record condition of raw coal pipe square to round.
- 13.2. Record condition of second section raw coal pipe.
- 13.3. Record condition of third section raw coal pipe.
- 13.4. State condition of the raw coal compensator and if worn renew.
- 13.5. State condition of fourth section raw coal pipe and renew if necessary.

14. CW SYSTEM

- 14.1. Check mill CW system for leaks and repair if necessary.

15. MILL MOTOR

- 15.1. Check bearing oil levels.
- 15.2. Correct any oil leaks.
- 15.3. Check foundation bolts for tightness.

- 1. Open the ball removal door.
- 2. Remove the 4 lifting rod cover plates on top of the classifier and position the 4 support stools over the lifting rod access holes.
- 3. Place 4 hydraulic jacks into the 4 support stools. (Use hydraulic jacks with hollow rams).
- 4. Couple the 4 hydraulic jacks to a single manifold and couple the manifold to a pneumatically driven power pack.

SERVICE ACTIONS

NB: Couple all pipes onto jacks first before connecting pipes onto power pack only then may air hose be fitted on to power pack.

- 5. Install 4 lifting rods through the ram of the hydraulic jacks.
- 6. Place a plain washer onto the lifting rod and screw on a nut.
- 7. Fit special wire sling to the spider and top grinding ring using a "bite" (Appendix 1). Protect the slings from corners by fitting protector brackets.
- 8. Screw the bottom support nut so that the threads of the lifting rod appear through the top of the support. Fit a plain washer to the lifting rod and screw on a nut.
- 9. Tension each lifting assembly by tightening the bottom support nut on to the retracted hydraulic jack.
NOTE: Inspect sling protection again to prevent damage to slings.
- 10. Pressure the 4 hyd jacks so that they extend. When the bottom support nuts are almost touching the top plates of the support stools, stop the jacks extending.
- 11. Inspect gap between caps and mill body internally and ensure correctness.
- 12. Screw down the 4 top nuts of the ring lifting rods until they are touching the four support stools.
- 13. Operate the hydraulic pump to retract the hydraulic jacks.
- 14. Screw the bottom support nuts down until they again make contact with the top of the hydraulic jacks.
- 15. Repeat points 10, 11, 12, 13 & 14 till the top ring has lifted so that the top ring lip is 30mm clear of the top of the grinding balls. Make sure the ring is lifting level by looking at the spider arms continuously.

NOTE: Ensure sling protections are in place.

- 16. Lock the lifting equipment by tightening the top nut against the support stool top plate and after retracting the jack; screw the bottom nut down onto the jack.

17. When removing and loading balls, make sure there are always 3 balls in the mill and that they are evenly distributed.
18. Always ensure that balls are carefully placed in bottom ring track and not rolled in uncontrolled.
19. Ensure that the forklift does not damage the bottom ring and the coal chute (note well).

20. SERVICE ACTIONS

WITNESS POINT:

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Plant specialist Signature Date

Notification No:

1. Number air blocks from mill ball loading door clock wise to avoid faulty measurements.
2. Using the right documentation (**appendix 1**) record measurements taken.
3. Use 600mm steel rules and throat gap gauge to take sizes of slots in air blocks.
4. Measure miscellaneous area evident at flapper door and between mill bottom ring and nose cones.
5. Measure classifier blades setting by using vane gauge.
6. Measure coal chute to table clearance. Clearance taken from table to where raw coal pipe ends. (Distance A appendix 2).
7. Measure vortex finder depth (distance B appendix 2).
8. Use info on appendix 1 and load onto applicable spreadsheet to determine total throat area.
 9. If area isn't between 0,59m² and 0,61 m² inform the plant specialist immediately.
 10. Plant specialist to determine which throat plates need to be closed.

NOTE: Start with the top slots when closing the throat plates. (Use a flat bar (± 6mm)).

11. Measure coal chute to table clearance (580mm).

WITNESS POINT:

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Plant specialist Signature Date

Notification No:

Check and replace (if required) P.A. damper bearings.

NB: Proceed as follows:

- (a) Loosen the four bolts on the bearing hold down plate.
- (b) Loosen the grub screws and pull the bearing towards the worker, just to give the small clearance between bearing plate and the damper casing.
- (c) Tighten the grub screws onto the damper shaft and turn the bearing to see if turns freely. (If not, please replace with a new bearing).
- (d) Check the condition of the bearing seal and grease it (if required) and also replace all the missing grease nipples.)
- (e) If using a new bearing – grease it with the recommended grease type. (BP-HTG).
- (f) Push the bearing back, align it properly and tighten the hold down bolts.
- (g) Make sure that the grub screws are also tightened onto the damper shaft.
- (h) After the P.T.W. has been cleared, make sure that the damper operates freely by driving it from the operators desk for fully open and fully closed settings while witnessing it from the plant as well.

WITNESS POINT:

.....
Plant specialist Signature Date

5.6 HISTORY REQUIREMENTS

					INSTR. NO A	H	B	I	1	0	5	3
					INSTR. NO B	H	B	I	1	0	5	8
					INSTR. NO C	H	B	I	1	0	5	9
DUVHA POWER STATION - BABCOCK MILL SERVICE INSTRUCTION												
INFORMATION REQUIREMENTS					SECTION: HMD MILL SECTION							
A SERVICE		INTERNAL INSPECTION					3 DAYS					
B SERVICE		INTERNAL INSPECTION AND BALL CHANGE					7 DAYS		MILL			
C SERVICE		INTERNAL INSPECTION, BALL AND RING CHANGE					15 DAYS		PILOT			
PROJECTS												
Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION		REFERENCE					
	A	B	C		SHEET NO.		NO.					
				SERIAL NUMBERS OF MAJOR COMPONENTS								
1	X	X	X	a) MILL GEARBOX		NM1001/PAGE1		BAB/M1/V2/S6				
	X	X	X	b) MILL MOTOR		NM1001/PAGE1						
	X	X	X	c) FEEDER GEARBOX		NM1001/PAGE1		BAB/M1/V2/S7				
	X	X	X	d) FEEDER MOTOR		NM1001/PAGE1		BAB/M1/V2/S7				
	X	X	X	e) CLEAN OUT CONVEYOR MOTOR		NM1001/PAGE1		BAB/M1/V2/S7				
	X	X	X	f) CLEAN OUT CONVEYOR GEARBOX		NM1001/PAGE1		BAB/M1/V2/S7				
	-	-	X	g) BOTTOM AND TOP RING		NM1001/PAGE1		BAB/M1/V2/S3				
	-	X	X	h) BALLS		NM1001/PAGE1		BAB/M1/V2/S3				
2				GRINDING BALLS				BAB/M1/V1/S3				
	X	X	X	a) INSPECT BALLS & RECORD CONDITION (CRACKS, DAMAGE)		NM1001/PAGE2		BAB/M1/V1/S3				
	X	X	X	b) RECORD EXISTING/REMOVED BALL SIZES		NM1001/PAGE1		BAB/M1/V1/S3				
	-	X	X	c) RECORD FITTED BALL SIZES		NM1001/PAGE1		BAB/M1/V1/S3				
3				GRINDING RINGS				BAB/M1/V1/S3				
	X	X	X	a) INSPECT RINGS AND RECORD CONDITION (CRACKS, CHIPPING, ABNORMAL WEAR)		NM1001/PAGE2		BAB/M1/V1/S3				
	X	X	X	b) RECORD EXISTING/REMOVED RING DIMENSIONS		NM1001/PAGE1		BAB/M1/V1/S3				
	-	-	X	c) RECORD NEW RINGS DIMENSIONS		NM1001/PAGE1		BAB/M1/V1/S3				

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
4				CLASSIFIER		
	X	X	X	a) INSPECT CLASSIFIER CONE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S5
	X	X	X	b) INSPECT SKIRTS & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S5
	X	X	X	c) INSPECT INNER CONE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S5
	X	X	X	d) INSPECT CLASSIFIER VANE BLADE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S5
	-	X	X	e) INSPECT PF DISCHARGE DUCT & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S5
	-	-	X	f) INSPECT/REPACK VANE SEAL	NM1001/PAGE2	BAB/M1/V2/S5
	-	X	X	g) INSPECT VORTEX FINDER AND RECORD CONDITION		BAB/M1/V2/S5
5				SPIDER		
	X	X	X	a) RECORD CLEARANCE "X" ON SWIVEL CUP	NM1001/PAGE1	BAB/M1/V2/S3
	X	X	X	b) INSPECT COUPLING & PINS AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S3
	-	X	X	c) RECORD THICKNESS OF SPIDER GUIDE WEAR PLATES	NM1001/PAGE1	BAB/M1/V2/S3
	-	X	X	d) RECORD THICKNESS OF MILL GUIDE PLATES	NM1001/PAGE1	BAB/M1/V2/S3
	-	X	X	e) RECORD THE SPIDER GUIDE GAPS ON THE NDE WEARPLATES WITH ZERO GAP ON THE SIDE OF SPIDER ARM WEARPLATES	NM1001/PAGE1	BAB/M1/V2/S3
	-	-	X	f) RECORD GAP BETWEEN THE SPIDER & TOP RING AT PLACES PROVIDED	NM1001/PAGE1	BAB/M1/V2/S3
	-	-	X	g) RENEW SPIDER ARM & CARRIER BOLTS	NM1001/PAGE2	BAB/M1/V2/S3
	-	X	X	h) INSPECT SEALANT BETWEEN SPIDER AND TOP RING	NM1001/PAGE2	BAB/M1/V2/S3

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
6				LOADING SYSTEM		
	X	X	X	a) CHECK BELLOWS FOR PERISHING & RENEW IF REQUIRED		BAB/M1/V1/S4
	X	X	X	b) RETENTION ALL BELLOWS		BAB/M1/V1/S4
	-	-	X	c) HYDRAULIC CABINETS TO BE CLEANED OUT AND NEW OIL TO BE PUT IN SYSTEM		
	-	-	X	d) HYDRAULIC HAND PUMP TO BE OVERHAULED		
	-	X	X	e) BOTH FILTERS ON SYSTEM TO BE CLEANED		
	-	-	X	f) ALL HYDRAULIC PIPES TO BE FLUSHED		
7				YOKE		BAB/M1/V1/S3
	-	X	X	a) RECORD GAP BETWEEN THE YOKE & THE BOTTOM RING	NM1001/PAGE1	BAB/M1/V1/S3
	-	X	X	b) INSPECT SEALANT BETWEEN YOKE & BOTTOM RING AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S3
8				MILL BODY		BAB/M1/V1/S2
	X	X	X	a) INSPECT ALL BOLT & NUTS INSIDE & ON MILL BODY FOR TIGHTNESS & LOCKING ARRANGEMENT	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	b) INSPECT MILL FOR DAMAGED COMPONENTS & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	c) INSPECT MILL LINER PLATES & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	d) INSPECT MILL FOUNDATION BOLTS FOR TIGHTNESS	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	e) INSPECT THROAT PLATES FOR WEAR & CRACKS	NM1001/PAGE2	BAB/M1/V1/S2

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
9				REJECT SYSTEM		BAB/M1/V1/S2
	X	X	X	a) INSPECT RELIEF GATE FOR FREE MOVEMENT & SEALING. RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	b) INSPECT REJECT BRUSH PLOUGHS & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	c) RECORD CLEARANCES BETWEEN THE BRUSHES & REJECT CHAMBER LINER PLATES	NM1001/PAGE1	BAB/M1/V1/S2
	X	X	X	d) REPLACE ALL REJECT BOX INSPECTION DOOR GASKETS & INSPECT REJECT BOX VENT VALVE	NM1001/PAGE2	BAB/M1/V1/S2
	-	X	X	e) INSPECT THE REJECT BOX INNER DOOR SPINDLE GLAND	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	f) INSPECT REJECT LINE AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	g) INSPECT JET PULSION PUMP ISOLATING VALVE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	h) GREASE JET PULSION PUMP ISOLATING VALVE & CHECK OPERATION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	i) INSPECT SEAL WATER ISOLATING VALVE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	j) INSPECT WATER SEAL DRAIN VALVE & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S2
	X	X	X	k) CLEAN THE WATER SEAL	NM1001/PAGE2	BAB/M1/V1/S2
	-	-	X	l) OVERHAUL JET PULSION PUMP	NM1001/PAGE2	BAB/M1/V1/S2

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
10				GEARBOX		
						BAB/M1/V2/S6
	-	X	X	a) INSPECT THE BIBBY COUPLING & SPRINGS & RECORD CONDITION. GREASE AS REQUIRED & BOX UP	NM1001/PAGE2	BAB/M1/V2/S6
	-	X	X	b) RECORD THE GAP BETWEEN THE TWO COUPLINGS & STATE THEIR ALIGNMENT	NM1001/PAGE1	BAB/M1/V2/S6
	-	X	X	c) GREASE THE LABYRINTH AND INPUT SHAFT SEAL		BAB/M1/V2/S6
	-	-	X	d) INSPECT THE VISIBLE CROWN WHEEL & PINION GEARS & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S6
	X	X	X	e) CLEAN AND INSPECT OIL FILTERS & RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S6
	-	X	X	f) RECORD THE BACKLASH ON THE INPUT SHAFT	NM1001/PAGE1	BAB/M1/V2/S6
	X	X	X	g) INSPECT GEAR LUBRICANT NOZZLES FOR FUNCTIONING	NM1001/PAGE2	BAB/M1/V2/S6
	X	X	X	h) TOP UP GEAR BOX OIL LEVEL & REPLACE BREATHERS		BAB/M1/V2/S6
	-	X	X	i) INSPECT GEARBOX LUB OIL PUMP		BAB/M1/V2/S6
	-	X	X	j) TORQUE TO BE CHECKED ON GEARBOX CASING BOLTS		BAB/M1/V2/S6
	-	X	X	k) TORQUE TO BE CHECKED ON GEARBOX FOUNDATION BOLTS		BAB/M1/V2/S6
	-	-	X	l) LUB OIL SYSTEM TO BE FILTERED		
11				MILL SUMP	NM1001/PAGE2	BAB/M1/V2/S8
	X	X	X	a) INSPECT THE MILL FOUNDATION SPRINGS AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S8
	X	X	X	b) INSPECT GERB DAMPERS AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S8
	X	X	X	c) INSPECT SUMP PUMP OPERATION AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V2/S8

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
12				COAL FEEDER	NM1001/PAGE2	BAB/M1/V2/S7
	X	X	X	a) INSPECT AND SET FEEDER BAR	NM1001/PAGE2	BAB/M1/V2/S7
	X	X	X	b) INSPECT COAL FLOW & DISCHARGE ALARM PADDLE FOR FREE MOVEMENT AND RECORD CONDITION	NM1001/PAGE1	BAB/M1/V2/S7
	X	X	X	c) INSPECT ALL FEEDER BEARINGS GREASE PIPES & SEALS AND RECORD CONDITION	NM1001/PAGE1	BAB/M1/V2/S7
	X	X	X	d) CHECK GAP BETWEEN COAL INLET CHUTE SIDE SKIRTING & BELT	NM1001/PAGE2	BAB/M1/V2/S7
	X	X	X	e) INSPECT FEEDER BELT TENSION & RECORD BELT CONDITION	NM1001/PAGE2	BAB/M1/V2/S7
	X	X	X	f) RECORD THE SLACK OF THE CLEAN OUT CONVEYOR CHAINS AT POINTS 'E' & 'F'	NM1001/PAGE1	BAB/M1/V2/S7
	X	X	X	g) INSPECT THE CHAIN SUPPORT PLATES AT BOTH ENDS OF THE CONVEYOR FOR WEAR AND RECORD CONDITION	NM1001/PAGE1	BAB/M1/V2/S7
	X	X	X	h) INSPECT CLEAN OUT CONVEYOR AND RECORD CONDITION	NM1001/PAGE1	BAB/M1/V2/S7
	X	X	X	i) INSPECT FEEDER TABLE FOR WEAR	NM1001/PAGE2	BAB/M1/V2/S7
	X	X	X	j) TEST RUN FEEDER & CHECK BELT ALIGNMENT & TRACKING AT LOW/HIGH SPEED	NM1001/PAGE2	BAB/M1/V2/S7
13				RAW COAL PIPE	NM1001/PAGE2	BAB/M1/V1/S1
	X	X	X	a) INSPECT THE RAW COAL PIPE SQUARE TO ROUND AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S1
	X	X	X	b) INSPECT SECTION TWO OF RAW COAL PIPE AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S1
	X	X	X	c) INSPECT SECTION THREE OF RAW COAL PIPE AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S1
	X	X	X	d) INSPECT THE RAW COAL COMPENSATOR AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S1
	X	X	X	e) INSPECT SECTION FOUR OF RAW COAL PIPE AND RECORD CONDITION	NM1001/PAGE2	BAB/M1/V1/S1

5.6 HISTORY REQUIREMENTS

Nr.	SERVICE			ACTIVITY DESCRIPTION	INSPECTION	REFERENCE
	A	B	C		SHEET NO.	NO.
				SERIAL NUMBERS OF MAJOR COMPONENTS		
14				CW SYSTEM		
	X	X	X	a) INSPECT FOR LEAKS AND REPAIR		
	-	-	X	b) CLEAN & PRESSURE TEST OIL COOLER		
	-	-	X	c) CLEAN OUT & REPAIR CW FLOW INDICATOR		
15				MILL MOTOR		
	-	-	X	a) DRAIN OIL FROM BEARINGS		
	-	-	X	b) OPEN AND INSPECT BEARINGS		
	-	-	X	c) BOX UP BEARINGS REFILL WITH OIL & INSPECT FOR OIL LEAKS		
	-	X	X	d) CHECK FOUNDATION BOLT TIGHTNESS		
	-	-	X	e) BIBBY COUPLING TO BE SPLIT ALIGNMENT DONE AND BOXED UP		
16	X	X	X	FILL IN ATTACHED BABCOCK MILL PERFORMANCE SHEET		

5.6 HISTORY REQUIREMENTS

BABCOCK MILL SERVICE INSPECTION RECORD

UNIT	1	2	3	4	MILL (I) SERVICE ISSUED (II) SERVICE COMPLETED (III) SERVICE RETURNED	A	B	C	D	E	F	SERVICE TO BE DONE BY HMD MILL SECTION
	/	/				/	/	/				
RUNNING HOURS					(I) MILL TOTAL	HRS						SERVICE NAME
					(II) RINGS: TOP	HRS						
					BOTTOM	HRS						
					(III) BALLS	HRS						
PREVIOUS SERVICE					(I) SERVICE HOURS	HRS						SIGN
					(II) BALL SIZE	MM						
NEXT SERVICE					(I) HOURS	HRS						DATE
					(II) BALL SIZE	MM						

SI No. 1	SERIAL No. OF MAJOR COMPONENTS	
COMPONENT	EXISTING/ REMOVED	REPLACED
MILL GEARBOX		
MILL MOTOR		
FEED GEARBOX		
FEEDER MOTOR		
BOTTOM RING		
TOP RING		
BALL No. 1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

SI No. 5	SPIDER DIMENSIONS IN mm			
THICKNESS OF ...	SPIDE GUIDE WEAR PLATE		MILL GUIDE PLATE	
	LEADING	TRAILING	LEADING	TRAIL- ING
NORTH	mm	mm	mm	mm
EAST	mm	mm	mm	mm
SOUTH	mm	mm	mm	mm
WEST	mm	mm	mm	mm

SI No. 5	SPIDER GUIDE GAPS ON THE NDE WEARPLATE	
	BEFORE WORK	AFTER WORK
NORTH	mm	mm
EAST	mm	mm
SOUTH	mm	mm
WEST	mm	mm

SI No. 5	GAP BETWEEN SPIDER & TOP RING	
NUMBER	mm	
1	mm	
2	mm	
3	mm	

5.6 HISTORY REQUIREMENTS

SI No. 2	GRINDING BALL SIZES IN mm		
	EXISTING/REMOVED		REPLACED
BALL NO. 1	mm		Mm
2	mm		Mm
3	mm		Mm
4	mm		Mm
5	mm		Mm
6	mm		Mm
7	mm		Mm
8	mm		mm
9	mm		mm
10	mm		mm
11	mm		mm

SI No. 6	YOKE DIMENSIONS IN mm	
GAP BETWEEN YOKE AND BOTTOM RING		
NORTH	mm	
EAST	mm	
SOUTH	mm	
WEST	mm	

SI No. 8	REJECT SYSTEM DIMENSIONS IN mm	
CLEARANCES BETWEEN BRUSHES & REJECT CHAMBER LINER PL		
ANGLE BRUSH INNER EDGE	mm	
ANGLE BRUSH INNER EDGE	mm	
STRAIGHT BRUSH INNER EDGE	mm	
STRAIGHT BRUSH INNER EDGE	mm	

SI No. 3	GRINDING RING SIZED IN mm			
	EXISTING/REMOVED		REPLACED	
	BOTTOM	TOP	BOTTOM	TOP
NORTH WEST 'A'				
NORTH EAST 'A'				
SOUTH WEST 'A'				
SOUTH EAST 'A'				
NORTH WEST 'C'				
NORTH EAST 'C'				
SOUTH WEST 'C'				
SOUTH EAST 'C'				
INNER DIAMETER				
OUTER DIAMETER				

SI No. 9	GEARBOX DIMENSIONS IN mm			
BACKLASH ON THE INPUT SHAFT			mm	
GAP BETWEEN THE TWO COUPLING			mm	
ALIGNMENT	BEFORE ALIGNMENT		AFTER ALIGNMENT	
	RADIAL	AXIAL	RADIAL	AXIAL
<div style="text-align: center;"> </div>				

ST No. 11	COAL FEEDER DIMENSIONS IN mm
SLACK OF CLEAN OUT CONVEYOR	
"E"	mm
"F"	mm

ST No. 5	SPIDER DIMENSIONS IN mm		
CLEARANCE "X" ON THE SWIVEL CUP			
No. 1	mm	No. 6	mm
No. 2	mm	No. 7	mm
No. 3	mm	No. 8	mm
No. 4	mm	No. 9	mm
No. 5	mm	No. 10	mm

CONTINUED

5.5 HISTORY REQUIREMENTS

5.6

REF. NO.						N	M	1	0	0	1
DUVHA POWER STATION BABCOCK MILL SERVICE INSPECTION RECORD											
UNIT	1	2	3	4	MILL	A	B	C	D	E	F
	/	/			(I) SERVICE ISSUED	/			/		
					II) SERVICE COMPLETED	/			/		
					III) SERVICE RETURNED	/			/		
						SERVICE			A	B	C
SI No. 2 GRINDING BALLS					CONDITION						
BALLS					OK NOT OK	REMARKS					
SI No. 3 GRINDING RINGS					CONDITION						
(a) TOP RINGS					OK NOT OK	REMARKS					
(b) BOTTOM RING					OK NOT OK	REMARKS					
SI No. 4 CLASSIFIER					CONDITION						
a) CLASSIFIER CONE					OK NOT OK	REMARKS					
b) SKIRTS					OK NOT OK	REMARKS					
c) INNER CONE					OK NOT OK	REMARKS					
d) VANE BLADES					OK NOT OK	REMARKS					
e) DISCHARGE DUCT					OK NOT OK	REMARKS					
f) VANE SEALS					OK NOT OK	REMARKS					
g) VORTEX FINDER					OK NOT OK	REMARKS					
SI No. 5 SPIDER					CONDITION						
b) COUPLING & PINS					OK NOT OK	REMARKS					
g) BOLTS (TIGHTNESS)					OK NOT OK	REMARKS					
h) SEALANT CONDITION					OK NOT OK	REMARKS					
SI No. 6 YOKE					CONDITION						
b) SEALANT					OK NOT OK	REMARKS					
SI No. 7 MILL BODY					CONDITION						
a) BOLTS (TIGHTNESS)					OK NOT OK	REMARKS					
b) DAMAGED COMPONENTS					OK NOT OK	REMARKS					
c) MILL LINING					OK NOT OK	REMARKS					
d) FOUNDATION BOLTS					OK NOT OK	REMARKS					
e) THROAT PLATES REPAIRED					OK NOT OK	REMARKS					

5.6 HISTORY REQUIREMENTS

SI No. 8 REJECT SYSTEM		CONDITION		
a)	RELIEF GATE	OK NOT OK	REMARKS	
b)	REJECT BRUSH PLOUGHS	OK NOT OK	REMARKS	
d)	INSPECTION DOOR GASKET	OK NOT OK	REMARKS	
e)	INNER DOOR SPINDLE GLAND	OK NOT OK	REMARKS	
f)	REJECT LINE	OK NOT OK	REMARKS	
g)	JET PULSION PUMP V/V	OK NOT OK	REMARKS	
h)	SEAL WTR ISOLATING V/V	OK NOT OK	REMARKS	
l)	WTR SEAL DRAIN V/V	OK NOT OK	REMARKS	
j)	WATER SEAL	OK NOT OK	REMARKS	
l)	OVERHAUL JET PULSION P/P	OK NOT OK	REMARKS	
m)	INSPECT REJECT BOX CASING AND GRATINGS	OK NOT OK	REMARKS	
SI No. 9 GEARBOX		CONDITION		
a)	BIBBY COUPLING & SPRINGS	OK NOT OK	REMARKS	
c)	LABYRINTH & INPUT SHAFT SEAL GREASED	OK NOT OK	REMARKS	
d)	CROWN WHEEL & PINION GEARS	OK NOT OK	REMARKS	
e)	OIL FILTERS	OK NOT OK	REMARKS	
g)	GEAR LUBRICATION NOZZLE FUNCTION	OK NOT OK	REMARKS	
SI No. 10 MILL SUMP		CONDITION		
a)	FOUNDATION SPRINGS	OK NOT OK	REMARKS	
b)	GERB DAMPER	OK NOT OK	REMARKS	
c)	SUMP PUMP OPERATION	OK NOT OK	REMARKS	
SI No. 11 COAL FEEDER		CONDITION		
a)	FEEDER BAR	OK NOT OK	REMARKS	
b)	FEED FLOW ALARM PADDLE	OK NOT OK	REMARKS	
b)	DISCHARGE ALARM PADDLE	OK NOT OK	REMARKS	
c)	GREASE PIPES & SEALS	OK NOT OK	REMARKS	
d)	BELT TENSION	OK NOT OK	REMARKS	
f)	CHAIN SUPPORT PLATES	OK NOT OK	REMARKS	
g)	CLEANOUT CONVEYOR	OK NOT OK	REMARKS	
h)	FEEDER TABLE WEAR	OK NOT OK	REMARKS	
l)	TEST RUN FEEDER	OK NOT OK	REMARKS	
SI No. 12 RAW COAL PIPES		CONDITION		
a)	SQUARE TO ROUND PIPES	OK NOT OK	REMARKS	
b)	SECOND SECTION	OK NOT OK	REMARKS	
c)	THIRD SECTION	OK NOT OK	REMARKS	
d)	COMPENSATOR	OK NOT OK	REMARKS	
e)	FOURTH SECTION	OK NOT OK	REMARKS	

NAME:

SIGN:

DATE:

5.6 HISTORY REQUIREMENTS

- 1. Were any of the wire slings damaged during the lifting of the top ring?
- 2. Were there any abnormalities present when lifting the top ring.
- 3. Was the ring lift action level at all times?.....

- 1. What is the condition of the air blocks?
- 2. Was the air blocks blocked with coal and if, so what percentage?
- 3. What is the condition of the flapper door?
- 4. What is the condition of the classifier vanes?

SPARES USED

STOCK NO	DESCRIPTION	USED
.....