Standard Operating Procedure	Maintenance of Electrical Drive Panel			Panel No:	
Prepared By	Maintenance Team	**Recommended By**	Section Incharge	**Feeder No:**	
Approved By	Chief Maintenance	**Issued By**	Division Manager	**Date**	__/__/_____

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
A. Pre-Maintenance Activities					
1	**Take Operation Permit** • Obtain written permission • Verify equipment status • Document permit details	• Unauthorized work • Equipment energization	• Ensure proper authorization • Verify safety clearances • Confirm equipment ready	Incharge	Mandatory
2	**Tool Box** • Conduct safety briefing • Review work scope • Assign responsibilities	• Lack of communication • Unclear roles	• Clear instructions (Dos and Don'ts) • Discuss emergency procedures • Ensure team understanding	Incharge	Essential
3	**Collect Tools & Equipment** • Insulated screwdrivers	• Damaged tools • Non-insulated	• Safe handling in box/bag • Check tool	Technician	As per requirement

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
	• Digital multimeter • Megger • Torque wrench • Cleaning materials	tools • Tool drop	condition • Use insulated tools only		
4	**Wear Proper PPE** • Safety helmet • Insulated safety shoes • Electrical gloves • Safety goggles • Arc flash suit (HT panels)	• Electric shock • Arc flash • Tool injury • Fall from height	• Ensure proper PPE worn • Check PPE condition • Use arc-rated PPE for energized work	Technician	Mandatory
5	**Take Electrical Isolation** • Request from control room • Verify equipment stopped • Confirm interlocks active	• Equipment energization • Unexpected start up • Gas poisoning	• Check Gas Monitor • Ensure complete de-energization • Verify zero energy state	Incharge	Critical
6	**Isolate Incoming Power** • Open circuit breaker • Rack out breaker • Open isolator	• Electric shock • Arc flash • Short circuit	• Follow switching sequence • Use insulated tools • Maintain safe distance • Wear appropriate PPE	Incharge	Critical
7	**Apply LOTO** • Apply personal locks • Attach danger tags • Document in register	• Accidental energization • Unauthorized operation	• Use standardized locks • Only authorized personnel have keys	Incharge	Life saving

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
	• Each worker applies own lock		• Multiple locks if needed • Workers keep own keys		
8	**Check Log Book** • Review maintenance records • Note recurring issues • Check previous observations • Identify problem history	• Missing information • Repeated failures	• Maintain proper documentation • Review trends • Use historical data	Incharge	Important
9	**Record Pre-Maintenance Parameters** • Motor voltage & current • Speed (RPM) • Temperature • Vibration levels • Note abnormal conditions	• Loss of operating data • No comparison baseline	• Record accurately • Take photographs • Compare with rated values • Note deviations	Incharge	Baseline data
10	**Check for Abnormal Smell** • Sniff for burning odor • Check overheating signs • Look for discoloration • Identify source	• Component failure • Fire hazard • Toxic fumes	• Ensure ventilation • Use gas detector • Evacuate if strong odor • Report to supervisor	Incharge	Warning sign
11	**Discharge Stored Energy** • Discharge DC capacitors • Wait	• Stored electrical energy • High voltage	• Wait specified time • Use voltage detector • Never	Incharge	Critical

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
	minimum 5 minutes • Verify zero voltage • Ground DC bus	discharge • Electric shock	assume discharged • Follow manufacturer procedure		
B. Main Maintenance Activities					
12	**Remove Rectifier Connection** • Disconnect from source • Tag disconnection point • Place red permit • Secure area	• Hand injury • Electric shock • Ergonomic strain	• Use proper tools • Wear electrical gloves • Proper ergonomics • Operate from safe side	Technician	Authorized only
13	**Discharge Intermediate Capacitors** • Wait 10-15 minutes • Verify with voltage detector • Check DC bus is zero • Inspect capacitor banks	• High voltage shock • Stored energy • Arc flash	• Proper discharge procedure • Never touch without verification • Use insulated discharge rod • Maintain safe distance	Technician	Life critical
14	**Test with Series Lamp** • Connect test lamp • Check residual voltage • Verify continuity • Lamp should not glow	• Hand injury • Electrical shock • False indication	• Use proper tools • Ensure lamp is working • Replace defective lamp • Verify functionality	Technician	Verification

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
15	**Open Panel & Clean** • Open doors carefully • Use compressed air (low pressure) • Clean with lint-free cloth • Remove dust • Clean filters	• Injury • Dust inhalation • Component damage	• Keep distance while opening • Wear dust mask • Use controlled pressure (below 30 PSI) • Protect sensitive components	Technician	Gentle cleaning
16	**Inspect All Components** • Visual inspection • Check for burn marks • Inspect PCBs • Check terminal tightness • Inspect wire insulation	• Hand injury • Ergonomic strain • Sharp edges	• Proper ergonomics • Use proper tools • Wear cut-resistant gloves • Careful of sharp edges	Technician	Thorough
17	**Clean Power Contactors** • Inspect contactor • Clean moving parts • Check contact wear • Lubricate per manual • Test operation	• Hand injury • Pinch points • Spring release	• Use proper tools • Aware of spring tension • Use approved cleaner • Check alignment	Technician	Critical component
18	**Check Auxiliary Components** • Test auxiliary contactors • Check current meters • Verify overload relay settings	• Hand injury • Eye injury • Electrical shock	• Spray away from eyes • Use hand gloves • Wear safety goggles • Handle carefully	Technician	Functional check

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
	• Inspect induction coils • Test relay operation				
19	**Check All Terminations** • Inspect wire terminations • Check loose connections • Look for overheating signs • Re-terminate if needed • Apply anti-oxidant	• Improper termination • Future failure • Arcing	• Proper termination procedure • Use correct ferrules • Apply proper crimping • Verify connection integrity	Technician	Quality check
20	**Tightness Check** • Check MCB mounting • Verify terminals • Torque check power connections • Check busbars • Inspect hardware	• Hand injury • Tool slip • Over-tightening	• Use proper tools • Apply specified torque • Use torque wrench • Don't over-tighten	Technician	Use torque specs
21	**Close the Panel** • Ensure all secured • Verify no tools inside • Close panel doors • Secure latches • Clean exterior	• Injury • Foreign object inside • Door pinch	• Keep distance while closing • Tool count before closing • Check door seals • Ensure proper alignment	Technician	Final assembly

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
C. Post-Maintenance Activities					
22	**Clear Work Area** • Remove all tools • Clean work area • Dispose waste properly • Account for all tools • Check for forgotten items	• Hand injury • Trip hazard • Lost tools	• Use hand gloves • Keep distance while closing • Proper housekeeping • Tool accountability	Technician	Cleanliness
23	**Take Control Trial** • Test control circuits • Verify interlocks • Check indicators • Test emergency stop	• Electrical shock • Equipment damage	• Do not touch any live part • Use proper testing procedure • Stand clear of equipment	Technician	Control check
24	**Ensure Healthiness of HMI** • Check display operation • Verify alarm functions • Test touchscreen • Check communication	• Display damage • Data loss	• Handle carefully • Don't apply excessive force • Verify data integrity	Incharge	HMI functional
25	**Power ON Drive** • Remove LOTO • Energize control circuit • Monitor for abnormalities	• Hand injury • Electrical shock • Improper start up	• Use proper tools • Use proper ergonomics • Operate handle from safe side	Technician	Gradual start up

Step No.	Sequence of the Activity	Hazards Associated	Safety Precautions	Responsibility	Remarks
	• Check all indications		• All personnel clear		
26	**Cancel Operation Permit** • Verify work complete • Return permit to control room • Document completion • Sign off permit	• Incomplete work • Miscommunication	• Verify all steps completed • Ensure area is safe • Proper documentation • Handover to operations	Incharge	Mandatory
27	**Put in Operation** • Start equipment as per SOP • Monitor parameters • Check for abnormal sounds • Verify smooth operation • Record parameters	• Equipment damage • Abnormal operation • Safety hazard	• Follow start up procedure • Monitor continuously • Be ready to stop • Check all parameters • Stay alert for 30 minutes	Technician	Close monitoring
28	**Update Log Book & Documentation** • Record all maintenance activities • Document findings • Note replacements • Update next maintenance date • File all records	• Incomplete records • Lost information	• Accurate documentation • Clear handwriting • Include all details • Sign and date entries	Incharge	Complete records

Overall Report:

Next Maintenance Date: ___/____/_____

Signature:

Maintenance Technician:

Section Incharge:

Chief Maintenance: