



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- VCB

Manufacturer's EM	Manufacturer's Name & Address	Customer BSPTCL	Vendor's Code:	Item: Indoor H.T panel with VCB & Outdoor vacuum ckt.breakers	M.Q.P. No. 011	Rev. No. 00	Valid From: 15.01.2016	Valid Upto: Till Revision
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<p>Code 1 Indicates place where testing is planned to be performed i.e. Inspection location</p> <p>A At Equipment Manufacturer's works B At Component Manufacturer's works C At Authorised Distributor's place D At Independent Lab E At Turn Key Contractor's location F Not specified</p>	<p>Code 2 Indicates who has to perform the tests i.e. Testing Agency</p> <p>J The Equipment Manufacturer K The Component Manufacturer L The Third Party M The Turnkey Contractor</p>
<p>Code 3 Indicates who shall witness the tests i.e. Witnessing Agency</p> <p>P Component Manufacturer itself Q Component Manufacturer and Equipment Manufacturer R Component Manufacturer, Equipment Manufacturer and Contractor S Equipment Manufacturer itself T Equipment Manufacturer and Contractor U Equipment Manufacturer, Contractor and BSPTCL V Third Party itself</p>	<p>Code 4 Review of Test Reports/Certificates</p> <p>W By Equipment manufacturer X By Contractor during product/process inspection Y By BSPTCL during product/process inspection Z By Contractor and/or BSPTCL during product/process inspection</p>
<p>Code 5 Whether specific approval of sub-vendor / Component make is envisaged?</p> <p>E Envisaged N Not Envisaged</p>	<p>Code 6 Whether test records required to be submitted after final inspection for issuance of Dispatch Instructions/Clearance ?</p> <p>Y Yes N No</p>

Notes:

1. The MQP should be read in conjunction with BSPTCL specification and shall deem to include additional tests if any required as per the contract.
2. BSPTCL specification shall include provisions of letter of Award , BSPTCL approved drawings /technical data sheet / BOM / test schedule / test procedure applicable to the specific contract.
3. In case of any contradiction between the manufacturer's plant standards , this MQP and BSPTCL specification following precedence shall be followed :-
 - a) BSPTCL specification .
 - b) This Manufacturing Quality plan .
 - c) Manufacturer's plant standards .
4. It is the responsibility of the manufacturer to ensure that this document is readily available at their works , as well as at the works of their sub vendors in order to avoid any delay at the time of inspection.
5. The manufacturer shall ensure that their as well as their sub vendors control , metering & testing instruments are duly calibrated and should have calibration certificates traceable . to Indian / International standards . Calibration records should be available during inspection by BSPTCL . Key testing instruments will be calibrated only by NABL accredited laboratories .



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6. In case of any tests being carried out at third party lab , such lab / facility should be NABL accredited / accepted by BSPTCL.

7. Witnessing of Acceptance Tests by BSPTCL shall be on 25% of the number of samples for acceptance test. The Contractor or Equipment Manufacturer will inform in advance the serial number of equipment/items being offered for inspection, so that BSPTCL can inform in advance to keep the selected samples ready for witnessing.

8. The manufacturer shall maintain the proper co-relation of test certificates from raw material stage to finished product stage and the records should be available during inspection . by BSPTCL.

9. Manufacturer shall show the approval of BSPTCL engineering for all contract specific type tests , including specific type tests if any as per the BSPTCL specification, at the time of final inspection.

10. All packing cases should be marked with BSPTCL LOA details , name of project , item description and DESPATCH INSTRUCTION/CLEARANCE (by which material has been cleared for dispatch) .

11. One copy of test report , DESPATCH INSTRUCTION/ CLEARANCE shall also be sent along with consignment .

12. Inspection of spare items ordered by BSPTCL shall also be governed by the provisions of this MQP . Items if not governed under MQP shall be offered for inspection as per BSPTCL specifications / Relevant-Indian / International Specification .

13. Any material rejected during BSPTCL inspection shall be disposed off with approval of BSPTCL. In case the material is to be returned to the component Manufacturer, all such items shall be indelibly marked (to prevent mixing) at the works of the manufacturer and offered to BSPTCL inspection engineer for verification of marking.

14. The manufacturer shall align their quality system and that of their sub-vendors to the requirements of latest ISO 9000 quality standards in a time bound manner .

15. The list of component manufacturers for which sub-vendor approval are envisaged is enclosed herewith.

17. BSPTCL may review the effective implementation of the processes during the product-inspection / process-inspection.

In case any violation in process or process parameters are observed, the reason along with corrective & preventive measures shall be conveyed to BSPTCL within 2 weeks.

EM : Equipment Manufacturer

CM : Component Manufacturer

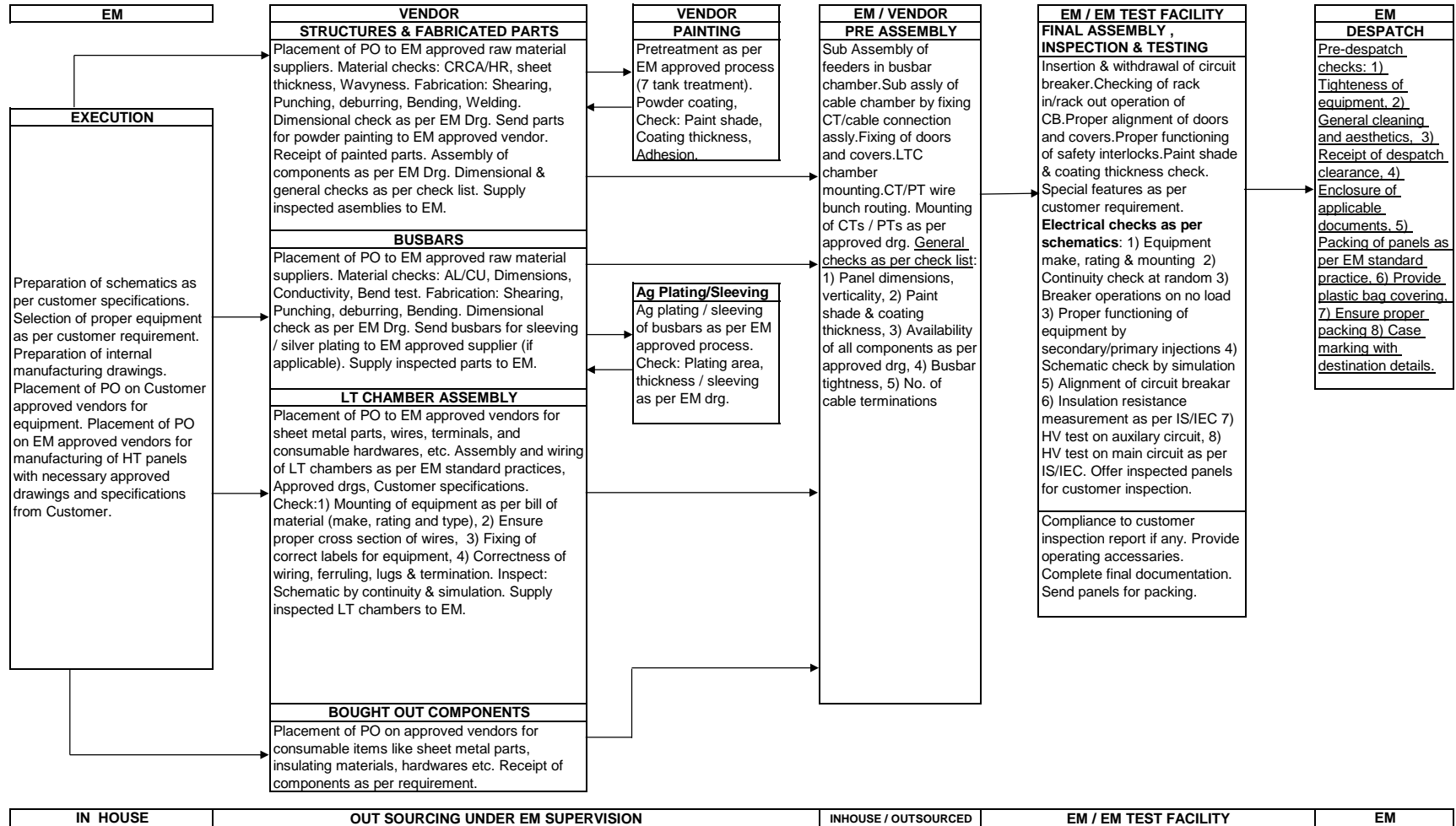
TC : Test Certificates



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- VCB

PROCESS FLOW CHART FOR HT PANEL MANUFACTURING

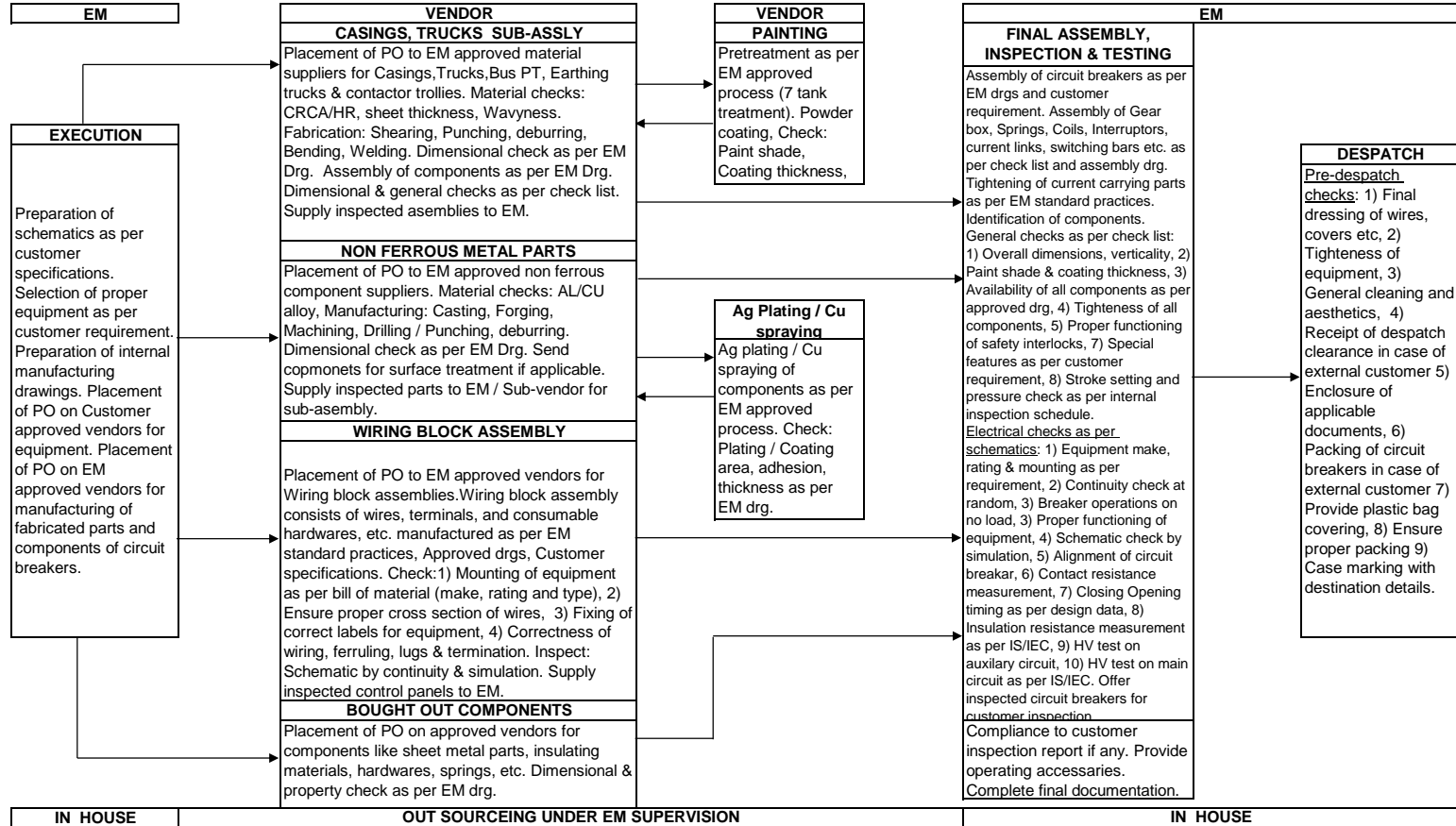




BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- VCB

PROCESS FLOW CHART FOR HT CIRCUIT BREAKER (IVCB) MANUFACTURING

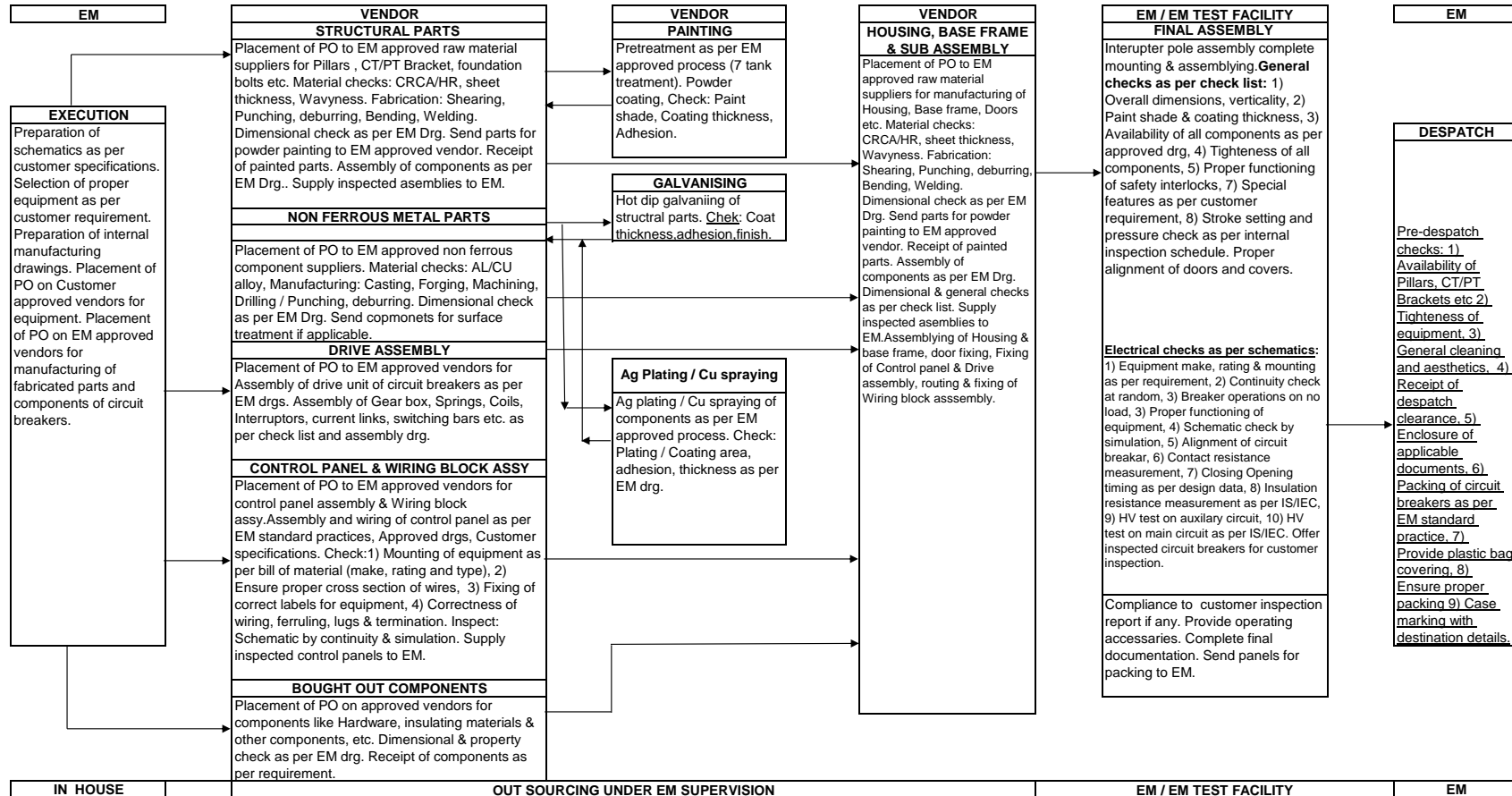




BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- VCB

PROCESS FLOW CHART FOR HT CIRCUIT BREAKER (OVCB) MANUFACTURING





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						Rev. No.	00		Valid Upto:			Till Revision	
						Date:							
Sr. No.	Components / Operations & Description of Test	Type of check	Quantum of Check / Sampling with basis	Reference document for Testing	Acceptance Norms	Format of Record	Applicable Codes						Remarks
							1	2	3	4	5	6	
A.	Raw Material Inspection												
1	Sheet steel CRCA/Hot rolled											E	Review of CMTc/EMTC during final inspection by BSPTCL
	1.1 Dimensions including thickness	Measurement	1 sample / lot	IS 513 - CRCA	IS 513 - CRCA	CM TC	B	K	P	W		N	
	1.2 Surface finish & waviness	Visual	100%	IS 1079 - HR	IS 1079 - HR		B	K	P	W		N	
	1.3 Physical properties	Mechanical	1 sample / lot				B	K	P	W		N	
	1.4 Chemical composition	Chemical	1 sample / lot				B	K	P	W		N	
2	Non Ferrous metals Cu / Al used in busbars											N	
	2.1 Dimensions	Measurement	1 sample / lot	IS 5082 - AL	IS 5082 - AL	CM TC	B	K	P	W		N	
	2.2 Surface finish & waviness	Visual	1 sample / lot	IS 613, 1897 - Cu	IS 613, 1897 - Cu		B	K	P	W		N	
	2.3 Conductivity	Mechanical	1 sample / lot				B	K	P	W		N	
	2.4 Chemical composition	Chemical	1 sample / lot				B	K	P	W		N	
3	Sheet metal fabricated parts											E	
	3.1 Dimensional check	Measurement	10% / lot	EM Drawing	EM Drawing	CM TC	B	K	P	W		N	
	3.2 Appearance	Visual	10% / lot				B	K	P	W		N	
4	Resin cast insulators											E	
	4.1 Dimensions	Measurement	2 samples / lot	IEC 660,	IEC 660,	CM TC	B	K	P	W		N	
	4.2 Surface finish	Visual	2 samples / lot	EM Drawing	EM Drawing		B	K	P	W		N	
	4.3 Cantilever force	Mechanical	2 samples / lot				B	K	P	W		N	
	4.4 HV test	Electrical	2 samples / lot				B	K	P	W		N	
5	Non ferrous metal parts i.e Cu , Al used for busbars											N	
	5.1 Dimensions	Measurement	10% / lot	EM Drawing	EM Drawing	CM TC	B	K	P	W		N	
	5.2 Finish	Visual	10% / lot				B	K	P	W		N	
6	Springs											E	
	6.1 Dimensions	Measurement	10% / lot	EM Drawing	EM Drawing	CM TC	B	K	P	W		N	
	6.2 Finish	Visual	10% / lot				B	K	P	W		N	
	6.3 Properties	Mechanical	10 Samples / lot				B	K	P	W		N	



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							1	2	3	4	5	6		
	(Voltmeter, Ammeter, Wattmeter, Varmeter, Frequency meter)													
	1.1 Make, Rating & Type	Visual	100%	IS 1248 part 2-5,	IS 1248 part 2-5,	CM TC	B	K	P	W		N		
	1.2 Apperance & finish	Visual	2 samples / type / lot	IEC 51,	IEC 51,		B	K	P	W		N		
	1.3 Calibration test	Electrical	100%	BSPTCL spec.,	BSPTCL spec.,		B	K	P	W		N		
	1.4 Functional test	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N		
2	Control / Selector switches											E	Review of CMTC/EMTC during final inspection by BSPTCL	
	2.1 Make, Rating & Type	Visual	100%	IS 13947 part 1-5,	IS 13947 part 1-5,	CM TC	B	K	P	W		N		
	2.2 Apperance & finish	Visual	2 samples / type / lot	IEC 60947,	IEC 60947,		B	K	P	W		N		
	2.3 Mechanical operation test	Mechanical	100%	BSPTCL spec.,	BSPTCL spec.,		B	K	P	W		N		
	2.4 Continuity check for contacts in different positions	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N		
3	MCB											E		
	3.1 Make, Rating & Type	Visual	5 samples / lot	IS 8828, IEC 60898	IS 8828, IEC 60898	EM Record	A	J	S	-		N		
	3.2 Functional check	Electrical	5 samples / lot	BSPTCL spec.,	BSPTCL spec.,		A	J	S	-		N		
	3.3 HV test	Electrical	5 samples / lot	EM spec.	EM spec.		A	J	S	-		N		
4	HRC control fuse link											E		
	4.1 Make, Rating & Type	Visual	100%	IS 13947 part 1-5,	IS 13947 part 1-5,	EM Record	A	J	S	-		N		
	4.2 Continuity test	Electrical	100%	IEC 60947,	IEC 60947,		A	J	S	-		N		
5	Space Heater											E		
	5.1 Make, Rating & Type	Visual	5 samples / lot	BSPTCL spec.,	BSPTCL spec.,	CM TC	A	J	S	W		N		
	5.2 Functional test	Electrical	5 samples / lot	EM spec.	EM spec.		A	J	S	W		N		
	5.3 HV test	Electrical	5 samples / lot				A	J	S	W		N		
6	Thermostat											E		
	6.1 Make, Rating & Type	Visual	5 samples / lot	BSPTCL spec.,	BSPTCL spec.,	CM TC	A	J	S	W		N		
	6.2 Functional test	Electrical	5 samples / lot	EM spec.	EM spec.		A	J	S	W		N		
	6.3 HV test	Electrical	5 samples / lot				A	J	S	W		N		



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							1	2	3	4	5	6	
	13.1 Visual check	Visual	100%	BSPTCL spec.,	BSPTCL spec.,	CM TC	B	K	P	W		N	
	13.2 Polarity check	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N	
	13.3 Ratio check	Electrical	100%				B	K	P	W		N	
	13.4 Accuracy class	Electrical	100%				B	K	P	W		N	
	13.5 HV test	Electrical	100%				B	K	P	W		N	
14	Annunciators (including window)											E	
	14.1 Visual check (inscription, size)	Visual	100%	BSPTCL spec.,	BSPTCL spec.,	CM TC	B	K	P	W		N	
	14.2 Routine test	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N	
	14.3 Functional check	Electrical	100%				B	K	P	W		N	
	14.4 HV test	Electrical	100%				B	K	P	W		N	
15	Mimic strip (If applicable)											N	
	15.1 Visual check for colour and symbol	Visual	1x Random sample	BSPTCL spec., EM spec.	BSPTCL spec., EM spec.	INSP REPORT	A	J	S	-		N	Review of CMTC/EMTC during final inspection by BSPTCL
	15.2 Dimensional check	Measurement	1x Random sample				A	J	S	-		N	
16	Semaphore indicators / Hooter / Bell / Buzzer / Test terminal block / Door switch											E	
	16.1 Visual check (Type, Rating)	Visual	1x Random sample	BSPTCL spec.,	BSPTCL spec.,	CM TC	B	K	P	W		N	
	16.2 Functional check	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N	
	16.3 HV test	Electrical	100%				B	K	P	W		N	
17	Current operated relay											E	
	17.1 Visual check (Type, Rating)	Visual	100%	IS 3231, IS 8686,	IS 3231, IS 8686,	CM TC	B	K	P	W		N	
	17.2 Functional check	Electrical	100%	IEC 60255	IEC 60255		B	K	P	W		N	
	17.3 HV test	Electrical	100%	BSPTCL spec., EM spec.	BSPTCL spec., EM spec.		B	K	P	W		N	
18	Voltage operated relay											E	
	18.1 Visual check (Type, Rating)	Visual	100%	IS 3231, IS 8686,	IS 3231, IS 8686,	CM TC	B	K	P	W		N	
	18.2 Functional check	Electrical	100%	IEC 60255	IEC 60255		B	K	P	W		N	
	18.3 HV test	Electrical	100%	BSPTCL spec.,	BSPTCL spec.,		B	K	P	W		N	



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							1	2	3	4	5	6	
	23.1 Rating & Type	Visual	100%	IEC 60470	IEC 60470	CM TC	B	K	P	W		N	
	23.2 Appearance & Finish	Visual	100%	EM spec.	EM spec.		B	K	P	W		N	
	23.3 Routine Tests	Elec. & Mech.	100%				B	K	P	W		N	
24	Surge Arrestors										E		
	24.1 Rating & Type	Visual	100%	IS 3070-3	IS 3070-3	CM TC	B	K	P	W		N	
	24.2 Appearance & Finish	Visual	100%	IEC 6099-4	IEC 6099-4		B	K	P	W		N	
	24.3 Routine Tests	Electrical	100%	EM spec.	EM spec.		B	K	P	W		N	
C. In Process Inspection													
1	Shearing, Punching, Bending, Deburring, Nibbling, Welding etc.										E		
	1.1 Visual check	Visual	1x Random sample	EM Drawing	EM Drawing		B	K	P	-		N	
	1.2 Dimensional check	Measurement	1x Random sample				B	K	P	-		N	
	1.3 Type of weld	Visual	1x Random sample	EM Drawing	EM Drawing		B	K	P	-		N	
	1.4 Weld Location	Measurement	1x Random sample				B	K	P	-		N	
	1.5 Weld Dimensions	Measurement	1x Random sample				B	K	P	-		N	
	1.6 Finish of Weld	Visual	1x Random sample				B	K	P	-		N	
Surface Treatment for all panels													
2	Pretreatment by 7 tank process										E		
	2.1 Degreasing Bath pointage	Chemical titration	100% Daily	EM spec. PTD-M/PMC/PNT/4.09	80-100 for P-20 50-70 for S-398	Log book, Lab test records	B	K	P	W		N	
	Bath temperature		Every four hour		75-85 °C							1) Review of records on surveillance basis by SL	
	2.2 Water rinsing at ambient temperature		100%		Oil layer should be removed		B	K	P	W		N	
	2.3 Derusting at ambient temperature		100%				B	K	P	W		N	
	Bath pointage	Chemical titration	Daily		20-26							2) Process validation on yearly basis by SL	
	2.4 Water rinsing at ambient temperature		100%		Derusting solution should be removed at 7% iron content		B	K	P	W		N	
	2.5 Phosphating		100%				B	K	P	W		N	



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	Bath pointage	Chemical titration	Daily		20-24								
	Bath temperature		Every four hour		65-70 °C								
	2.6 Water rinsing at ambient temperature		100%		Sluge should be removed	B	K	P	W		N		
	2.7 Passivation		100%			B	K	P	W		N		
	Bath pointage	pH measurement	Daily		2-4 pH								
	2.8 Hot air drying		100%		Should show whitish streak	B	K	P	W		N		
	Scratch test by blunt knife	Scratch test	Once / batch										
3	Powder Coated Painting										E		
	3.1 Paint shade	Visual	100%	BSPTCL spec.,	BSPTCL spec.,	INSP REPORT	B	K	P	W		N	
	3.2 Surface finish	Visual	Random samples	EM spec.	EM spec.		B	K	P	W		N	
	3.3 Coating thickness	Measurement	Random samples every hour	PTD-M/PMC/PNT/4.09	80 micron average of 9x readings on each plain surface		B	K	P	W		N	
	Structural Assembly												
4	Structural sub-assembly											N	
	4.1 Visual check	Visual	100%	EM Drawing	EM Drawing	INSP REPORT	B	K/J	P/Q	W		N	
	4.2 Dimensional check	Measurement	100%				B	K/J	P/Q	W		N	
	Structure pillars for OVCB			BSPTCL Spec/ EM spec.		CM TC							
	4.4 Visual & ditional check	Visual/measurement					B	K	P	W		N	
	4.4 Uniformity of galvanizing	Visual					B	K	P	W		N	
	4.5 Thichness of galvanizing	Measurement					B	K	P	W		N	
	4.6 Mass of Zinc coating	Measurement					B	K	P	W		N	
5	Structural final assembly											N	
	5.1 Correctness of assembly	Visual	100%	EM Drawing	EM Drawing	INSP REPORT	B	K/J	P/Q	W		N	
	5.2 Dimensions	Measurement	100%				B	K/J	P/Q	W		N	
	Circuit Breakers												
6	Electrical Functions											N	
	6.1 Rating of coils, motor	Visual	100%	Order instruction sheet	Order instruction sheet	INSP REPORT	A	J	S			N	

Review of
CMTC/EMTC
during final
inspection by
BSPTCL



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							1	2	3	4	5	6	
	6.2 Auxiliary switch	Electrical	100%	EM Drawing	EM Drawing		A	J	S			N	
	6.3 Wiring Correctness	Electrical	100%				A	J	S			N	
7	Mechanical Functions											N	
	7.1 Functioning of Gear box and Spring charging motor	Mechanical	100%	EM spec.	EM spec.	INSP REPORT	A	J	S			N	
	7.2 CB opening & closing	Mechanical	100%				A	J	S			N	
	7.3 Stroke adjustments	Mechanical	100%				A	J	S			N	
	7.4 Contact pressure	Mechanical	100%				A	J	S			N	
	7.5 Spring checking for any abnormality	Visual	100%				A	J	S			N	
	Switchboards												
8	Busbar, feeder connection and cable termination assembly											N	
	8.1 Material	Visual	100%	Order instruction sheet	Order instruction sheet	INSP REPORT	A/B	J/K	P	W		N	
	8.2 Size	Measurement	100%	EM Drawing	EM Drawing		A/B	J/K	P	W		N	
	8.3 Arrangement	Visual	100%				A/B	J/K	P	W		N	
	8.4 Tightening of joints	Measurement	Random samples				A/B	J/K	P	W		N	
	8.5 Phase identification marking	Visual	100%				A/B	J/K	P	W		N	
9	Equipment mounting & connections											E	
	9.1 Type & Details	Visual	100%	Order instruction sheet	Order instruction sheet	INSP REPORT	B	K	P	W		N	Review of CMTC/EMTC during final inspection by BSPTCL
	9.2 Damages / defects	Visual / Functional	100%	EM Drawing	EM Drawing		B	K	P	W		N	
	9.3 Layout & mounting	Visual	100%				B	K	P	W		N	
	9.4 Alignment	Visual / Functional	100%				B	K	P	W		N	
	9.5 Electrical connections	Visual / continuity	100%				B	K	P	W		N	
	9.6 Ferrules / sleeves on wires	Visual	Random samples				B	K	P	W		N	
	9.7 Earthing	Visual / continuity	100%				B	K	P	W		N	
	9.8 Operation	Functional	100%				B	K	P	W		N	
10	Final assembly / General points											N	
	10.1 Overall dimensions	Measurement	Random sample	Order instruction sheet	Order instruction sheet	INSP REPORT	A/B	J/K	P	W		N	
	10.2 Paint shade	Visual	100%	EM Drawing	EM Drawing		A/B	J/K	P	W		N	
	10.3 Surface finish	Visual	100%				A/B	J/K	P	W		N	
	10.4 Door alignment	Functional	100%				A/B	J/K	P	W		N	



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	10.5 Gaskets	Visual	100%					A/B	J/K	P	W		N	
	10.6 Wire dressing	Visual	100%					A/B	J/K	P	W		N	
	10.7 Interchangeability	Functional	Random sample					A/B	J/K	P	W		N	
	10.8 Nameplates	Visual	100%					A/B	J/K	P	W		N	
	10.9 Identification marks	Visual	100%					A/B	J/K	P	W		N	
	10.10 General aesthetics	Visual	100%					A/B	J/K	P	W		N	
	10.11 Order related features	Visual / Functional	100%					A/B	J/K	P	W		N	
D.	ROUTINE TESTS													
1	Routine Tests for Circuit Breaker													
	1.1 Spring charging	Electrical	100%	IS 12729, 13118	IS 12729, 13118	INSP REPORT		A	J	S	W		N	
	1.2 CB operation timings	Electrical	100%	IEC 60694, 622271-100	IEC 60694, 622271-100			A	J	S	W		N	
	1.3 Resistance of main circuit	Electrical	100%	EM spec.	EM spec.			A	J	S	W		N	
	1.4 HV test on auxiliary circuit	Electrical	100%	(IEC 694, 56 for Indoor CB above 12kV)	(IEC 694, 56 for Indoor CB above 12kV)			A	J	S	W		N	
	1.5 HV test on main circuit	Electrical	100%					A	J	S	W		N	
	1.6 Alignment & disengagement of tension spring after 100 operations	Visual	100%			Routine Test Certificate		A	J	S	W		Y	
	Routine tests for switchboard and Breaker all tests as per acceptance tests mentioned below													
			100%											
2	Switchboard routine test													
	2.1 Electrical connections	Visual	100%	IS 12729, 3427	IS 12729, 3427	INSP REPORT		A	J	S	W		N	
	2.2 Operation tests on no load by simulation of circuit	Elec. & Mech.	100%	IEC 60694, 62271-200 (IEC 694, 298 for switchboards above 12kV)	IEC 60694, 62271-200 (IEC 694, 298 for switchboards above 12kV)			A	J	S	W		N	
	2.3 Insulation resistance test	Electrical	100%					A	J	S	W		N	
	2.4 HV test on main circuits	Electrical	100%					A	J	S	W		N	
	2.5 HV test on aux. Circuit	Electrical	100%	Order instruction sheet EM Drawing	Order instruction sheet EM Drawing			A	J	S	W		N	
E.	FINAL INSPECTION & TESTING													
1	Circuit Breakers													
	1.1 Spring Charging / Check for spring disengagement	Elec. & Mech.		IS 12729, 13118	IS 12729, 13118	Routine Test Certificate		A	J	U	Y		Y	C.I.P



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- VCB

EM	Manufacturer's Name & Address		Customer	BSPTCL	Vendor's Code:	Item:	M.Q.P. No.	011			Valid From:	15.01.2016	
						Indoor H.T panel with VCB & Outdoor vacuum ckt. breakers	Rev. No.	00			Valid Upto:	Till Revision	
							Date:						
Sr. No.	Components / Operations & Description of Test	Type of check	Quantum of Check / Sampling with basis	Reference document for Testing	Acceptance Norms	Format of Record	Applicable Codes						Remarks
							1	2	3	4	5	6	
	1.2 CB Closing & Opening on no load	Elec. & Mech.		IEC 60694, 622271-100	IEC 60694, 622271-100		A	J	U	Y		Y	C.I.P
	1.3 Resistance of main circuit	Electrical		EM spec.	EM spec.		A	J	U	Y		Y	C.I.P
	1.4 CB operation timings with speed curves	Electrical		(IEC 694, 56 for Indoor	(IEC 694, 56 for Indoor	INSP REPORT	A	J	U	Y		Y	C.I.P
	1.5 HV test on aux. Circuit	Electrical		CB above 12kV)	CB above 12kV)		A	J	U	Y		Y	C.I.P
	1.6 HV test on main circuit	Electrical		BSPTCL spec.	BSPTCL spec.		A	J	U	Y		Y	C.I.P
2	Switchboards												
	2.1 Visual check of electrical conn./ BOM check & Dimentional check	Visual / measurement	Random samples	BSPTCL spec.	BSPTCL spec.,		A	J	U	Y		Y	C.I.P
	2.2 Paint finish & coating thickness	Measurement	Random samples	EM spec.	EM spec.		A	J	U	Y		Y	C.I.P
				PTD-M/PMC/PNT/4.09	80 micron average of 9x readings on each plain surface								
	2.3 Operation test on no load	Elec. & Mech.		IS 12729, 3427	IS 12729, 3427		A	J	U	Y		Y	C.I.P
	2.4 Insulation resistance test	Electrical		IEC 60694, 62271-200	IEC 60694, 62271-200		A	J	U	Y		Y	C.I.P
	2.5 HV test on aux. Circuit	Electrical		(IEC 694, 298 for	(IEC 694, 298 for		A	J	U	Y		Y	C.I.P
	2.6 HV test on main circuit	Electrical		switchboards above	switchboards above		A	J	U	Y		Y	C.I.P
	2.7 Order related features	Visual / Functional		12kV)	12kV)		A	J	U	Y		Y	C.I.P
				Order instruction sheet	Order instruction sheet								
				EM Drawing	EM Drawing								
				BSPTCL spec.	BSPTCL spec.								
3	Structural Assembly												
	4.4 Visual & dimentional check	Visual/measurement	Random samples	Approved drawing			A	J	U	Y		Y	C.I.P
	4.4 Uniformity of galvanizing	Visual	Random samples				A	J	U	Y		Y	C.I.P
	4.5 Thichness of galvanizing	Measurement	Random samples	86 microns min/ BSPTCL Specs			A	J	U	Y		Y	C.I.P
F.	Packing and Despatch												
1	Pre-despatch checks												
	1.1 Packing worthyness	Visual	100%	BSPTCL spec.,	BSPTCL spec.,	EM's Records	A	J	S	-	E	N	
	1.2 Identification marking on packed cases	Visual	100%	Approved drawings,	Approved drawings,		A	J	S	-	E	N	
				EM spec.	EM spec.								
	1.3 Despatch destination marking	Visual	100%				A	J	S	-	E	N	
	1.4 Handling and storage instructions	Visual	100%				A	J	S	-	E	N	
	1.5 Enclosure of applicable documents, Sr. No. Records of	Visual	100%				A	J	S	-	E	N	

VENDOR LIST

Sr.no.	Category	Name of Vendor	Address	E-mail
1	Current Transformer/Potential transformer	PRAGATI ELECTRICALS P LTD. (HT CT, PT, CBCT, Control trafo)	R-230,TTC,MIDC INDUSTRIAL AREA, RABALE, NAVI MUMBAI 400701	vishal.borse@pragatielelectricals.com
2	Current Transformer/Potential transformer	Electrical Controls & Systems (ECS) (HT CT, PT, CBCT, Control trafo, Close/Trip coils for HT circuit breakers)	Plot No 866/2 G.I.D.C. Makarpura, Vadodara, 390010.	amit@epoxyhouse.com
3	Current Transformer/Potential transformer	KAPPA ELECTRICALS (HT CT, PT, CBCT, Control trafo)	5/3 CART TRACK ROAD, MADUVANKARAI, CHENNAI 600042	KAPPA@VSNL.COM
4	Current Transformer/Potential transformer	GEMINI INSTRATECH PVT. LTD. (HT CT, PT, CBCT, Control trafo)	H 43, MIDC, AMBAD, NASHIK, 422010	manojp@geminiinstratech.com
5	Miscellaneous panel items	SHUBHADA POLYMERS PRODUCTS PVT LTD (HT earthing switches, CVD, Busbar joint shrouds, Insulating materials, Switching bars, 12/36kV HT bushings)	CTS 111,OPP.L&T GATE NO.5, SAKI VIHAR ROAD POWAI, MUMBAI, 400072	gfp@bom5.vsnl.net.in
6	Miscellaneous panel items	Raychem Rpg Ltd (HT surge arrestors for indoor HT panels)	1/62 MG Rd, Off Western Express, Highway, Near BHP, Post Sativali, Vasai, Thane 401208	sraman@raychemrpg.com
7	Fabricated Busbars / HT busbar sleeves	Raychem RPG Ltd (HT busbar insulating sleeve, Fabricated busbarsfor HT panels)	CEAT Mahal Annexe, 463, Dr. Annie Besant Rd., Mumbai, 400025	
8	PVC Wires	RR KABEL LTD (Control wires/cables of various size & type for HT panel)	RAM RATNA HOUSE,OASIS COMPLEX, KAMLA MILL COMP., S.B.MARGLOWER PAREL, MUMBAI, 400042	RAMRATNA@BOL.NET.IN
9	PVC Wires	Rolliflex Industries (Control wires/cables of various size & type for HT panel)	202, Sangam Arcade, V.P. Road, Opposite Station Vile Parle (W), Mumbai 400056	ROLLIFLEX@VSNL.COM
10	PVC Wires	Polycab Wires (Control wires/cables of various size & type for HT panel)	HICO House, 1st floor, Pandit Satawalekar Marg, Mahim(W) , Mumbai 400016	nrkhush@polycab.com
11	IVCB components	INSULE PRODUCTS (Busbar support insulators, Breaker pole insulators)	19 ANJU SHOPPING CENTRE, TILAK ROAD, SANTACRUZ WEST, MUMBAI, 400054	GFP@BOM5.VSNL.NET.IN
12	Miscellaneous panel items	Mascasts (Busbar support insulators)	14/15 Apurva Indl Estate Makwana Rd, Marol Naka Andheri, Mumbai 400059	mascasts@satyam.net.in
13	Miscellaneous panel items	INDIA INSULATORS (Busbar support insulators, Breaker pole insulators)	NEAR MARATHE MILLS, MIRAJ, MAHARASHTRA, 416410	SAN_PRECAST@SANCHARNET.IN
14	Miscellaneous panel items	Multi Crafts (Insulating materials, Busbar joint shrouds)	Shed No 81-B/6 MIDC, General Block Bhosari, Pune, 411026	MULTICRAFTS@VSNL.COM
15	Miscellaneous panel items	GLASSFIBRE & ALLIED INDUSTRIES (Insulating materials & auxillary s/w)	SUN CHAMBERS, NEXT TO CANARA BANK, GOREGAON EAST, MUMBAI, 400063	GLASSFIBRE@VSNL.COM

VENDOR LIST

16	IVCB components	Liberty Moulding Works (Nylon moulded parts for HT breakers, Contact arms for HT breakers)	Unit No 4 Raut Ind Estate, Senapati Bapat Marg, Mahim, Mumbai, 400016	pradeep_kumar@hotmai.com
17	Sheet metal fabricators	SHRI SWASTIK ENGINEERS PVT LTD (Sheet metal fabricated structural parts and sub-assembly)	W-395M.I.D.C.RABALE, NAVI MUMBAI, 400701	sseplw395@yahoo.com
18	Sheet metal fabricators	Manik Industrial Engineering Ltd (Sheet metal fabricated parts)	Lakhi Ind House, L.B.S. Marg, Bhandup (W), Mumbai, 400078	DKM@MANIKINDI.A.COM
19	Sheet metal fabricators	GWS ENGINEERS & FABRICATORS PVT (Sheet metal fabricated structural parts and sub-assembly)	A-512 MAHAPE ,MIDC,TTC INDL AREA, OFF THANE BELAPUR ROAD, NAVI MUMBAI	GWSENGINEERS@REDIFFMAIL.COM
20	Discontinued	DHANASHREE METALS PVT. LTD. (Sheet metal fabricated parts)	PLOT NO.55 NCZ,MIDC TALQJA, NAVI MUMBAI, 410206	NP_DEO@REDIFFMAIL.COM
21	Discontinued	UNIVERSAL WIRE INDUSTRIES (Sheet metal fabricated structural parts and sub-assembly)	PLOT NO.347,TTC INDL.AREA, MIDC, RABALE, NAVI MUMBAI, 400602	UWI@VSNL.COM
22	Sheet metal fabricators	SPRING STEEL PRODUCTS (Sheet metal fabricated structural parts and sub-assembly)	PLOT NO.A-298,ROAD Z, OFF ROAD 16 WAGLE ESTATE, THANE, 400604	SPRINGSTEEL@VSNL.NET
23	Sheet metal fabricators	SUWINKA ENGINEERING PVT. LTD. (Sheet metal fabricated structural parts and sub-assembly)	R-803 T.T.C.INDUSTRIAL ESTATE, RABALE, NAVI MUMBAI, 400701	SUWINKA@VSNL.NET
24	Sheet metal fabricators	Symatic Engg. Pvt Ltd. (Sheet metal fabricated structural parts and sub-assembly)	Plot no EL-127/128, TTC , Electronic Zone, Mahape, Navi Mumbai-400710	
25	Sheet metal fabricators	Jyotitech Industries (Sheet metal fabricated structural parts and sub-assembly)	R-607, TTC Industrial area, Rabale, Navi - Mumbai - 400 701	
26	IVCB components	Refair Industries (Non ferrous components for HT breakers,)	Unit 57 Block A Nand Jyot Ind Est, Near IBM Andheri East, Mumbai, 400072	refairind444@yahoo.co.in
27	IVCB components	Refair Industries (Contact arms for HT breakers)	R444 TTC Indl Area, Rabale, Navi Mumbai, 400701	REFAIRIND444@YAHOO.CO.IN
28	Fabricated Busbars	Cen-Mech Industries. (Fabricated busbars for HT panels)	R-365 , TTC , MIDC, Rabale, Navi Mumbai, 400701	centralengineering@rediffmail.com
29	Powder Coater	M J ENTERPRISES (Sheet metal pre-treatment and powder coating, Zinc metalising, Copper spraying)	A-448,MIDC,MAHAPE,OFF THANE BELAPUR ROAD, NAVI MUMBAI, THANE, 400701	MJENT@BOM7.VSNL.NET.IN
30	Powder Coater	M.J.COATERS PVT.LTD (Sheet metal posder coating)	A-474,TTC INDUSTRIAL AREA, MIDC,MAHAPE, NAVI MUMBAI, 400701	MJCOATERS@VSNL.NET
31	OVCB components	NEW UNITED METAL AND ENGG WORKS (Non ferrous metal parts like aluminium flanges for HT breakers)	PLOT 52-B SCHEME 56, SION DHARAVI, MUMBAI, 400017	REYNOLDP@GIASBM01.VSNL.NET.IN

VENDOR LIST

32	Sheet metal fabricators	UNITY ENGINEERS (Sheet metal fabricated parts, HT outdoor circuit breaker structural parts)	16 PUNJANI INDUSTRIAL ESTATE, POKHRAN ROAD NO 1, KHOPAT, THANE, 400601	UNITYENG@BOM7.VSNL.NET.IN
33	Sheet metal fabricators	REVATHI ENTERPRISES (Sheet metal fabricated parts, Sub-assemblies for HT circuit breakers)	UNIT NO 10, BUILDING NO 4, AGARWAL UDYOG NAGAR, SATIVALI ROAD, VASAI(E), THANE 401202	hctawde@mtnl.net.in
34	Sheet metal fabricators	SHETH FABRICATORS PVT LTD (Sheet metal fabricated parts, Sub-assemblies for HT circuit breakers)	R-676 TTC MIDC BEHIND PIPE LINE, THANE BELAPUR ROAD RABALE, THANE 400601	SFPL@VSNL.COM
35	OVCB components	RASHMI ENTERPRISES (Structural parts for HT outdoor circuit breakers)	202, A WING, VERTAX VIKAS, 2nd FLOOR, V.ROAD, ANDHERI(EAST), MUMBAI 400069	ARVINDRATHOD@HOTMAIL.COM
36	IVCB / OVCB components	FAL INDUSTRIES LTD. (Spring charging motors for HT circuit breakers)	52.SIPCOT INDUSTRIAL COMPLEX, HOSUR 635126 TN, HOSUR, 635126	FAL@CHN.FAL.CO.IN
37	IVCB / OVCB components	MAGNA MOTORS (Spring charging motors for HT circuit breakers)	NO.232, 2nd MAIN, 4th STAGE, RAJAJINAGAR INDUSTRIAL TOWN, BANGALORE 560044	MAGNAMOT@MANTRAONLINE.COM
38	IVCB / OVCB components	Baroda Bushings & Insulators (Insulating parts for HT circuit breakers, insulating stud)	Epoxy House, 745/1-2, G.I.D.C. Estate, Makaroura Road, Vadodra 390010	BBI@EPOXYHOUSE.COM
39	OVCB components	Utsav Electro-mech Pvt Ltd (Terminal connectors for HT outdoor circuit breakers)	202/1 G.I.D.C., Makarpura, Baroda, 390010	PENTIUM@PN3.VSNL.NET.IN
40	Rubber item	SUHEG RUBBER INDUSTRIES PVT.LTD. (Gaskets, O rings for HT circuit breakers)	W-49 B MIDC RABALE NEXT TO IPCL CATAD, THANA BELAPUR ROAD, NAVI MUMBAI, 400701	
41	Miscellaneous panel items	Sure Electronics (Space heaters for HT outdoor circuit breakers)	117/2 Manish Ind Estate, Navghar, Vasai Road (E), Thane, 401210	sure@sureelectronics.com
42	Miscellaneous panel items	SHREE SAI ELECTRICAL INDUSTRIES (Space heaters for HT panels)	SARAF KASKAR IND.ESTATE, GALA NO.B2, S.V.ROAD JOGESHWARI (W), MUMBAI 400102	MN SIDHWANI@HOTMAIL.COM
43	Miscellaneous panel items	APT CONTROLS & APPLIANCES PVT LTD (Thermostat for HT panels and outdoor circuit breakers)	120 & 121, BLDG.I, UDYOG VIHAR IND. ESTATE, VITHALWADI (W), ULHAS NAGAR, 421003	APT@BOM7.VSNL.NET.IN
44	Miscellaneous panel items	APT CONTROLS & APPLIANCES PVT LTD (Space heaters for HT panels)	120 & 121, BLDG.I, UDYOG VIHAR IND. ESTATE, VITHALWADI (W), ULHAS NAGAR, 421003	APT@BOM7.VSNL.NET.IN

VENDOR LIST

45	IVCB / OVCB components	INSPROS ENGINEERS PVT (Close/Trip coils for HT circuit breakers, Fast tripping coils)	M/S ELECTRO TRANS, 42-B, DEVKARAN MANSION VITHALDAS RD, LOHAR CHAWL, MUMBAI, 400002	INSPROS@VSNL. COM
46	IVCB / OVCB components	RAPSRI ENGG INDUSTRIES LTD. (Non ferrous metal parts for HT circuit breakers)	39/40-2, GOWDANAPALYA, SUBRAMANYAPURA PO, BANGALORE, 560061	RAPSRI@VSNL.C OM
47	OVCB components	W.S.INDUSTRIES(INDIA) LTD (Ceramic insulators for outdoor circuit breakers)	P.O.B NO.6 PORUR, CHENNAI, 600116	WSIPORUR@MD3. VSNL.NET.IN
48	OVCB components	JAIPUR GLASS & POTTERIES (Ceramic insulators for outdoor circuit breakers)	TONK ROAD, JAIPUR, 302018	JAIPUR.GLASS@D ATAINFOSYS.NET
49	OVCB components	Ravikiran Ceramics Pvt. Ltd. (Ceramic insulators for outdoor circuit breakers)	Station Road, P.O. Via Anand, Kanjari, 387325	INFO@RAVIKIRAN CERAMICS.COM
50	OVCB components	Birla Ngk Insulators Private Ltd. (Jayshree Insulators) (Ceramic insulators for outdoor circuit breakers)	PO Meghasar Taluka Halol, Dist Panchmahal, Gujarat, 389330	jsihdom@adityabirl a.com
51	IVCB / OVCB components	Precision Spring Works (Switch ON/OFF springs for HT circuit breakers)	Unit No 15 K C Industrial Est., Subash Road, Jogeshwari-E, Mumbai, 400060	precisionsprings@v snl.net
52	Control Panel assy/wiring	APEX INDUSTRIES (Control panel assembly)	EL 41,T.T.C.INDUSTRIAL AREA, M.I.D.C.MAHAPE, NAVI MUMBAI, 400705	apexind@rediffmail. com
53	Discontinued	JYOTI CONTROLS (Control panel assembly, HT panel structural assembly)	R-554, RABALE MIDC IND AREA, NAVI MUMBAI, 400701	JYOTITECHINDUS TRIES@REDIFFM AIL
54	Control Panel assy/wiring	Jyotitech Industries (Control panel assembly, HT panel structural assembly)	R-419, TTC, Industrial Area, M G Road, Rabale, Navi Mumbai, 400701	JYOTITECHINDUS TRIES@REDIFFM AIL
55	Control Panel assy/wiring	JYOTI SWITCHGEARS PVT LTD (Control panel assembly, HT panel structural assembly)	R-456, TTC INDUSTRIAL AREA, RABALE, NAVI MUMBAI, 400701	
56	Control Panel assy/wiring	COMBINED DIGILOG SYSTEMS PVT.LTD. (Control panel assembly)	PLOT NO.EL- 111.ELECTRONIC ZONE, TC-MIDC IND AREA MAHAPE, NAVI MUMBAI, 400701	COMNILOG@BOL. NET.IN
57	Control Panel assy/wiring	Maharashtra Electro Mechanical Work (Control panel assembly)	Plot No A-220 Opp Mahape Bus Depot, MIDC TTC Industrial Area, Mahape, Navi Mumbai, 400701	MEMWPVTLTD@H OTMAIL.COM
58	Control Panel assy/wiring	Symatic Engg. Pvt Ltd. (Control panel assembly, HT panel structural assembly)	128 MIDC TTC (Electronic Zone), Thane Belapur Road Mahape, Navi Mumbai, 400709	SYMATIC@BOM3. VSNL.NET.IN
59	Control Panel assy/wiring	CENTRAL ENGINEERING (Control panel assembly, HT panel structural assembly)	B-9,T.T.C.MIDC, DIGHE, NAVI MUMBAI, 400701	centralengineering @rediffmail.com

VENDOR LIST

60	Control Panel assy/wiring	Vibha Mechano Electric India Pvt Ltd (Control panel assy, HT panel structural assy)	Plot no A-117 to A-120, MIDC Dombivli (E), Phase - I, Thane -412 201	narasimha.reddy@vibhaindia.in
61	Miscellaneous panel items	REHAU AG + Co (Gasket for HT panel)	Ytterbium 4, Erlangen, 91058, Germany, PB 30 29	Erlangen@REHAU.com
62	Miscellaneous panel items	Rehau Polymers Pvt. Ltd. Mumbai (Gasket for HT panel)	1002, 10th floor, Casablanca, Sector 11, Plot no. 45, CBD Belapur, Navi Mumbai, 400614	sanjay.gautam@rehau.co.in
63	Al Busbars	HINDALCO INDUSTRIES LTD. (Electrolytic grade aluminium busbars)	P.O RENUKOOT, DIST : SONBHADRA, RENUKOOT 231217	
64	Al Busbars	Hindalco Industries Ltd (Electrolytic grade aluminium busbars)	B Wing 1st Floor Ahura Complex, 82 Mahakali Caves Road, Andheri (E), Mumbai, 400093	HINDALCO.BBY@RMJ.SPRINGRPG.EMS.VSNL.NET.IN
65	Cu Busbars	SUNMET INDUSTRIES (Electrolytic grade copper busbars)	251, AGRASEN BHAVAN, THAKURDWAR ROAD, MUMBAI, 400092	sunmet@bom5.vsnl.net.in
66	Cu Busbars	Metal Gems (Electrolytic grade copper busbars)	Plot No. 113 to 120, Panchai Udyog Nagar Bhimpur, Daman, 396210	metal_gems@yahoo.co.in
67	Cu Busbars	Baroda Conductors Pvt Ltd (Electrolytic grade copper busbars)	G/2 Rushi Apartments, Near Visa Court Sayed Vasna Rd, Baroda, 390015	BCPL@BNPL.COM
68	Cu Busbars	D.C. METAL CORPORATION (Electrolytic grade copper busbars)	B/5 & 6,PRAVASHI INDL EST. OFF AAREY ROAD GOREGAON (E), MUMBAI 400063	KCCOPPER@SATYAM.NET.IN
69	Miscellaneous panel items	PLASTO FORM PRODUCTS (Insulating materials)	UNIT-12 SWASTIK IND EST, 178 VIDYANAGARI MARG KALINA, MUMBAI, 400098	plastoform@vsnl.net
70	Discontinued	PATEL AUTO ENGINEERING CO.INDIA (Sheet metal fabricated parts and sub-assemblies)	PLOT NO R-848,MIDC TTC INDUSTRIAL, AREA POST GHANSOLIRABALE, NAVI MUMBAI, 400701	NEEDHISH@VSNL.COM
71	OVCB components	Radiance(Al Flanges ,Non ferrous metal parts like aluminium flanges for HT breakers)	A 233, KAGAL-HATKANGALE, 5 Star MIDC, Kolhapur , Maharashtra	san_koustug@sancarnet.in
72	OVCB components	Shree Shyam (Mech Housing (Sheet metal fabricated parts, Sub-assemblies for HT circuit breakers)	Plot no A-41, TTC Industrial Area, Off Thane Belapur Road, Pawne MIDC, Navi - Mumbai, 400705	
73	OVCB components	Vishal Malleable (Insulator (Ceramic insulators for outdoor circuit breakers) & AL alloy - castings	Plot No: 100 & 102 /103, Rajipla Road, Ankleshwar - 393002	info@vishalmalleables.com
74	Rubber item	Precise Rubber (O ring Gaskets , O rings for HT circuit breakers) & Sealing (O ring & Gaskets)	3/01, Khurana Compound,Patel Road, Goregaon(E) , Mumbai-400063	
75	OVCB components	Prestine Metal Form Pvt Ltd.(Mechanism Housing)	C/347, TTC Indl Area, MIDC pawne village, Turbhe, navi-Mumbai, Thane, 400705	pristine_mfpl@yahoo.com

VENDOR LIST

76	Rubber item	Json polymer (O ring Gaskets , O rings for HT circuit breakers) & Sealing (O ring & Gaskets)	5, Gopal House, 1.B patel road, Goregaon(E), Mumbai-400063	jsonpolymer@gmail.com
77	IVCB / OVCB components	Salzer (Breaker control switch)		
78	Cu Busbars	Metal Tubes & Rolling Mills (Copper triangular Busbars)	Marol Village , Andheri (E)	mtm@copperzone.com
79	IVCB / OVCB components	Techno Fusion (current link)	48, Bindal Indl. Estate, off Andheri Kurla road, Sakinaka	technofusion@vsnl.net
80	IVCB / OVCB components	Panchal Electro Controls (current links)	208, Ruby Monarch Arcade, 2nd floor, Saki vihar road, Sakinaka	pepl@yahoo.com
81	OVCB components	CJI (ceramic Insulators)	Junction Rd.Khurja - 203131	
82	OVCB components	Jenith Technocast (Structural parts)	Plot E-2, MIDC, Rajanangaon, Sirur, Pune-412209	
83	IVCB / OVCB components	ECS (Close/Trip coils for HT circuit breakers, Fast triping coils)	Plot No 866/2 G.I.D.C. Makarpura, Vadodara 390010	
84	OVCB components	Shirke (Auxillary switch)		
85	Miscellaneous panel items	Connectwell (terminal block)	W-6, Phase-II, MIDC, Dombivli (E), Thane	
86	Miscellaneous panel items	Elmex (terminal block)	12, GIDC Estate, Makarpura Road, Vadodara-390010	navin@elmex.net
87	Miscellaneous panel items	Wago (terminal block)		
88	Miscellaneous panel items	MDS (Miniature ckt breaker)		
89	Miscellaneous panel items	Schnider (MCB's, indicating lamps)		
90	Miscellaneous panel items	Shirke (Breaker control switch)	L-25, MIDC Ambad, NASHIK	jiten@shirkeswitch.net; jshirke@gmail.com
91	Miscellaneous panel items	Technic (Indicating lamps)		
92	Miscellaneous panel items	Electromech (Operation counter)		
93	Miscellaneous panel items	Meyle-Germany (Limit s/ws)		
94	Miscellaneous panel items	Elmex (Limit s/ws)		


 BIHAR STATE POWER TRANSMISSION COMPANY LIMITED		
MANUFACTURING QUALITY PLAN -- VCB		
LIST OF SUPPLIERS FOR SWITCHBOARDS		
S.NO.	DESCRIPTION	MAKE
1	Current Transformer	Pragati, ECS, Kappa, Gemini
2	Potential Transformers	Pragati, ECS, Kappa, Gemini
3	Vacuum Circuit Breakers	Siemens
4	Vacuum Contactors	Siemens
5	Earthing Switch	Shubhada Polymers
6	Isolators	Siemens
7	Surge Arrestors	Raychem, Siemens
8	Control Wires	RR Kables / Polycab / Rolliflex
9	Resin cast Insulators	Insule Products, Mascasts, India Insulators
10	Insulating Materials	Shubhada Polymers, Multicraft, Glass-Fibre Allied, Liberty Moulding
11	Protection Relays - Numerical	Siemens, ABB, Areva
12	Protection Relays Electromechanical	Easun Reyrolle, Areva, ABB, Ashida, JVS
13	Auxiliary Relays	Easun Reyrolle, Areva, Ashida,
14	Meters and Instruments	AE, MECO, Enercon, Schneider
15	Multifunction meter	AE, Enercon, Secure, L&T, Schneider
16	Indicating Lamps	Siemens
17	Push Buttons	Siemens
18	Annunciators	Minilec, Alan
19	Semaphore Indicators	DAV, Areva
20	Terminal Blocks	Connectwell, Elmex, Wago
21	Transducers	MECO, AE
22	Control Switches	Switron, Kaycee
23	Breaker Control Switch	Switron, Areva, Kaycee
24	Ammeter / Voltmeter Selector Switch	Siemens, Switron, Kaycee
25	Auxiliary Contactors	Siemens
26	Control Fuses	Siemens
27	MCBs	Siemens, MDS Legrand, Indo-kopp, Schneider

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Indoor Panel Vendor List

PTD-M/QM

LIST OF SUPPLIERS FOR SWITCHBOARDS		
S.NO.	DESCRIPTION	MAKE
28	Buzzer / Hooter / Bell	Alan, Vaishno
29	Thermostat	APT Control
30	Space Heater	Shree Sai Electricals,Sure Electricals,APT controls
31	Plug-Switch & Socket	Anchor, Cona, CPL
32	Terminal test block	IMP, DAV, Areva
33	Limit Switch	Siemens, Kaycee
34	Illumination Lamp	Philips , Bajaj
35	Sheet Metal parts	Shree Swastik, Suwinka, GWS, Symatic , Jyotitech
36	Panel structure fabrication	Symatic Engineering,Jyotitech Industries, Spring Steel, Shree Swastik, GWS, Suwinka, Vibha Mechano
37	Control wiring	Apex Industries, Jyoti Tech, Jyoti Switchgears pvt Ltd. Maharashtra Electro., Symatic, Central Engg., Combined Digilog Vibha Mechano Electric pvt Ltd
38	Busbar manufacturing	Raychem, Refair, Cen-Mech
39	Powder Coating	MJ Enterprises, MJ Coaters

 BIHAR STATE POWER TRANSMISSION COMPANY LIMITED		
MANUFACTURING QUALITY PLAN -- VCB		
LIST OF SUPPLIERS FOR CIRCUIT BREAKERS		
S.NO.	DESCRIPTION	MAKE
1	Al alloy castings	New United Metal Works, Radiance, Vishal Malleable
2	Sheet Steel Fabrication	Unity Engineers, Revathi Enterprises,
3	Switch cubicle Fabrication	Revathi Enterprises, Prestige Metal Works
4	Machining	Unity Engineers, Revathi Enterprises, Pristine Metal forms Pvt Ltd
5	Structures	Unity Engineers, Rashmi Enterprises, Jenith technocast
6	Motor	FAL Industries, Magna Motors
7	Operating rod	Baroda bushings, Shubhada Polymers
8	Auxiliary Switch	Shubhada Polymers
9	Terminal Connectors	Utsav Electromech
10	Control Cables	RR Kables / Polycab / Rolliflex
11	Sealing (O ring)	Suheg Rubbers, Precise rubber, Json polymer
12	Hot dip Galvanising	Sigma Galvanisers, Five Star Galvanisers, Jenith Technocast
13	Close / Trip coil	Inspros Engg, ECS
14	Rotary Switch	Switron Devices, Salzer
15	Space Heater	Shree Sai Electricals, Sure Electricals, APT controls
16	Operation Counter	Electromech
17	Insulators	WS, IEC, BHEL, Ravikiran Indu, Jaipur Potteries
18	Levers	Unideritend
19	Chromium Copper castings / Forgings	Rapsri Engg., Modison Metals
20	Main Arcing contact	Siemens Germany
21	Main Contact	Siemens Germany
22	Spring	Precision Springs
23	Terminal Block	Connectwell, Elemex, Wago
24	MCB	Siemens, Legrand, Indo-Kopp
25	Breaker Control Switch	Switron, Salzer, Shirke
26	Control Fuses	Siemens
27	Indicating Lamps - if applicable	Siemens
28	Cubicle Lamp Holder	Philips , Bajaj, CPL, Cona, Anchor
29	Illumination Lamp	Philips , Bajaj
29	Auxiliary Contactor	Siemens
30	Limit Switch	Siemens, Meyle-Germany
31	Switch for illumination Lamp	CPL, Cona, Anchor
32	Switch for space heater	CPL, Cona, Anchor
33	Fast acting tripping release	Siemens