



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN-- SF6 GAS CIRCUIT BREAKER

		Customer BSPTCL	Vendor's Code:	Item : 145 kV & 245 kV SF6 GAS CIRCUIT BREAKER	Q.P. NO. 010 Rev. No. 00 Date : 02.01.2016	Valid From : 15.01.2016 Valid Upto : Till Revision
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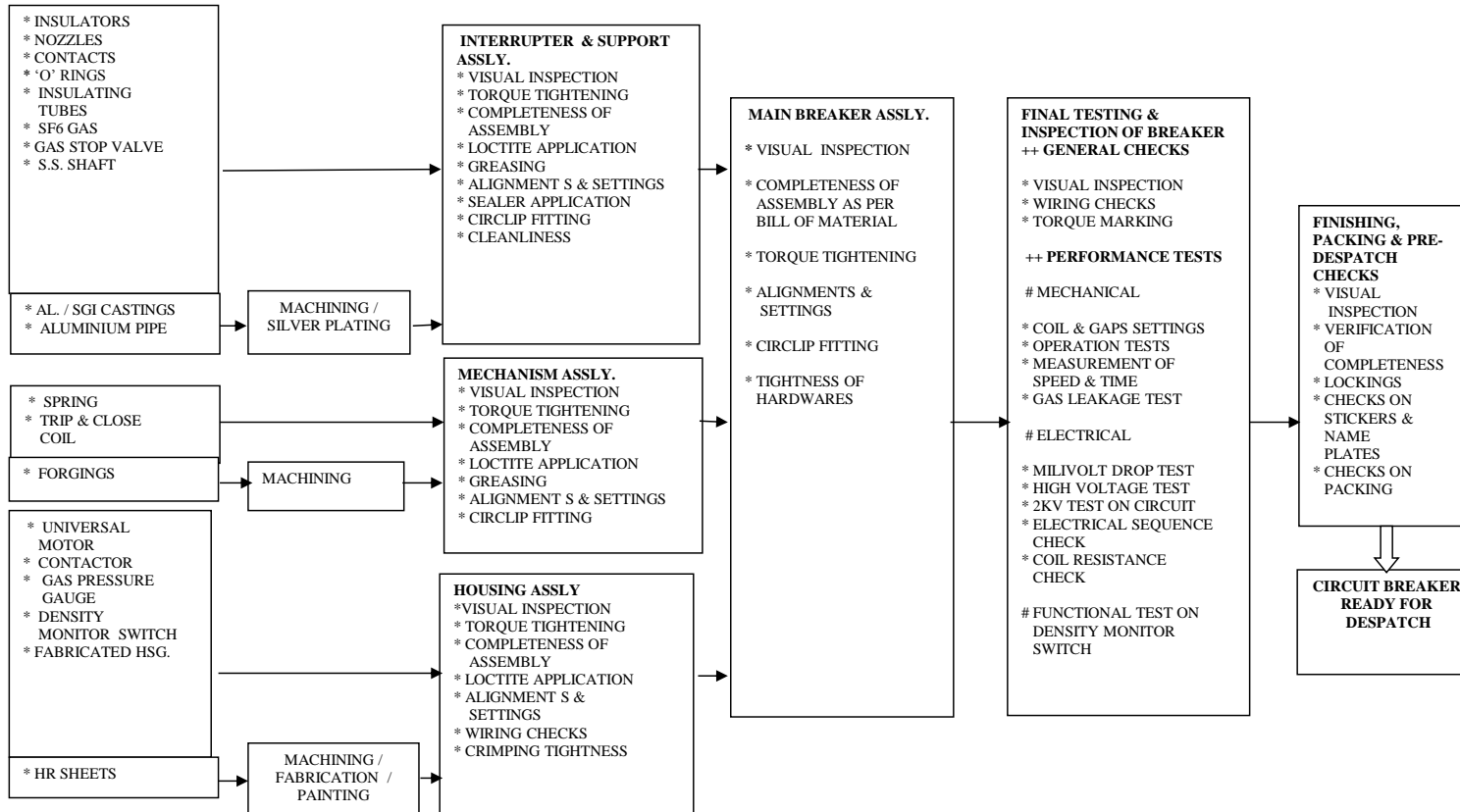
BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN-- SF6 GAS CIRCUIT BREAKER

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PROCESS FLOWCHART FOR 145kV/245 kV SF6 GAS CIRCUIT BREAKERS. (MQP No. 010)

RAW MATERIAL INSPECTION	IN-PROCESS INSPECTION	FINAL INSPECTION & TESTING	PACKING & DESPATCH
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	Manufacturer, Name & Add.	Customer	Item:	Vendor's Code	QP No.	10	Valid from:	15.01.2016
		BSPTCL	145 kV & 245 kV SF6 GAS		Rev. No.	0	Valid upto:	Till Revision
Code 1	Indicates place where testing is planned to be performed i.e. Inspection			Code 2	Indicates who has to perform the tests i.e. Testing Agency			
A	At Equipment Manufacturer's works			J	The Equipment Manufacturer			
B	At Component Manufacturer's works			K	The Component Manufacturer			
C	At Authorised Distributor's place			L	The Third Party			
D	At Independent Lab			M	The Turnkey Contractor			
E	At Turn Key Contractor's location							
F	Not specified							
Code 3	Indicates who shall witness the tests i.e. Witnessing Agency			Code 4	Review of Test Reports/Certificates			
P	Component Manufacturer itself			W	By Equipment manufacturer			
Q	Component Manufacturer and Equipment Manufacturer			X	By Contractor during product/process inspection			
R	Component Manufacturer, Equipment Manufacturer and Contractor			Y	By BSPTCL during product/process inspection			
S	Equipment Manufacturer itself			Z	By Contractor and/or BSPTCL during product/process inspection			
T	Equipment Manufacturer and Contractor							
U	Equipment Manufacturer, Contractor and BSPTCL							
V	Third Party itself							
Code 5	Whether specific approval of sub-vendor / Component make is envisaged?			Code 6	Whether test records required to be submitted after final inspection for issuance of Dispatch Instructions/Clearance?			
E	Envisaged			Y	Yes			
N	Not Envisaged			N	No			
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-- SF6 GAS CIRCUIT BREAKER .								
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 .								
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 10% 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.								

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	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 Dispatch Instructions/Clearance number (by which material has been cleared for dispatch) .							
	11. One copy of test report , Dispatch Instructions/Clearance & MICC 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. 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 .							
	14. The list of component manufacturers for which sub-vendor approval are envisaged is enclosed herewith.							
	15. 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.							
	16. In case the Terminal Connectors are being supplied, separate approved MQP for terminal connector shall be applicable.							
	17. Any addition/change in new vendor/design/process shall call for review by BSPTCL & change in MQP, if necessary.							
	18. Repair procedure notes.							
	EM : Equipment Manufacturer		CM : Component Manufacturer		TC : Test Certificates			



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Sr.No.	Components / Operations & Description of Test	Type of Check	Quantam of check / Sampling with basis	Reference documents	Acceptance norm	Format of record	Codes						Remarks
							1	2	3	4	5	6	
2.5	C) Arc Resistance Dielectric test in SF6 Gas at Rated pressure	Electrical	100%			EM Record	A	J	S	W		N	During routine testing of breaker
2.6	Specific Gravity	Physical	1/lot			CMTC	B	K	P	W		N	
3.0	PUFFER CYLINDER (Aluminium Pipe)											E	
3.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W		N	
3.2	Dimensional check	Measure	2/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W		N	
3.3	Chemical Analysis	Chemical	1/lot	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W		N	
3.4	Tensile Test	Mechanical	1/lot			CMTC	B	K	P	W		N	
3.5	Proof Stress	Mechanical	1/lot			CMTC	B	K	P	W		N	
3.6	Elongation	Mechanical	1/lot			CMTC	B	K	P	W		N	
4.0	STATIONARY ARC CONTACT											E	
4.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W		N	
4.2	Dimensional check	Measure	2/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W		N	
4.3	Hardness of base body	Mechanical	1/lot	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W		N	
4.4	Chemical Analysis	Chemical	1/lot			CMTC	B	K	P	W		N	
4.5	Chemical composition of Copper Tungsten tip	Chemical	1/lot			CMTC	B	K	P	W		N	
4.6	Hardness for Tungsten Copper tip	Mechanical	1/lot			CMTC	B	K	P	W		N	
4.7	Conductivity of Arcing tip	Electrical	1/lot			CMTC	B	K	P	W		N	
4.8	Microstructure	Metallurgical	1/lot									E	
5.0	MOVING ARC CONTACT											E	
5.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W		N	
5.2	Dimensional Check	Measure	2/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W		N	
5.3	Hardness of base body	Mechanical	1/lot	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W		N	



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							1	2	3	4	5	6	
5.4	Chemical Analysis of base body	Chemical	1/lot			CMTC	B	K	P	W		N	
5.5	Chemical Composition for copper & Tungstan	Chemical	1/lot			CMTC	B	K	P	W		N	
5.6	Hardness for Tungstan Copper tip	Mechanical	1/lot			CMTC	B	K	P	W		N	
5.7	Conductivity for Copper Tungsten tip	Electrical	1/lot			CMTC	B	K	P	W		N	
6.0	STATIONARY CONTACT MOVING CONTACTS & FIXED FINGER CONTACT											E	
6.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W		N	
6.2	Hardness	Mechanical	1/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W		N	
6.3	Conductivity	Electrical	1/lot	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W		N	
6.4	Chemical Analysis	Chemical	1/lot			CMTC	B	K	P	W		N	
6.5	Tensile Strength	Mechanical	1/lot			CMTC	B	K	P	W		N	
6.6	Yield Strength	Mechanical	1/lot			CMTC	B	K	P	W		N	
6.7	Elongation	Mechanical	1/lot			CMTC	B	K	P	W		N	
6.8	Dimensional Check	Measure	2/lot			CMTC	B	K	P	W		N	
6.9	Silver plating thickness	Measure	1/lot			CMTC	B	K	P	W		N	
6.10	Adhesion of Silver plating	Physical	1/lot			CMTC	B	K	P	W		N	
7.0	NOZZLE											E	
7.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W		N	
7.2	Dimensional check	Measure	2/lot	Plant Drawing	Plant Drawing	CMTC	B	K	P	W		N	



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							1	2	3	4	5	6	
7.3	Chemical Composition	Chemical	1/lot	As per approved GTP and Drawing of BSPTCL Mat.Spec. As per EM	As per approved GTP and Drawing of BSPTCL Mat.Spec. As per EM	CMTC	B	K	P	W	N		
7.4	Tensile strength	Mechanical	1/lot			CMTC	B	K	P	W	N		
7.5	Elongation	Mechanical	1/lot			CMTC	B	K	P	W	N		
7.6	Specific Gravity	Physical	1/lot			CMTC	B	K	P	W	N		
7.7	Deformation in Hot oven ageing	Thermal	1/lot			CMTC	B	K	P	W	N		
8	Contactors			Manufacturer's Catalog	Manufacturer's Catalog						E	Items accepted based on Component Catalogue.	
9.0	GAS PRESSURE GAUGE										E		
9.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W	N		
9.2	Accuracy (± 1.5% on full scale deflection) (Calibration)	Measure	100%	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W	N		
9.3	Over load Test	Physical	1/lot			CMTC	B	K	P	W	N		
10.0	SEALING (O RING) (Imported)										E		
10.1	Visual check	Visual	100%		No damage	CMTC	B	K	P	W	N		
10.2	Dimensional Check	Measure	1/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W	N		
10.3	Hardness	Mechanical	1/lot	Mat. Spec. As per EM	Mat. Spec. As per EM	CMTC	B	K	P	W	N		
10.4	Material Base	Chemical	1/lot			CMTC	B	K	P	W	N		
10.5	Ozone Resistance(Type test)	Physical	1/type			CMTC	B	K	P	W	N		
11.0	SPRINGS										E		
11.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W	N	Vendor audit &	



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							1	2	3	4	5	6	
11.2	Dimensional Check	Measure	2/lot	PlantDrawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W	N	inspection to be conducted once in a year and records to be shown during inspection	
11.3	Load Characteristics	Mechanical	100%			CMTC	B	K	P	W	N		
11.4	Chemical Check	Chemical	1/lot	Mat spec As per EM	Mat spec As per EM	CMTC	B	K	P	W	N		
11.5	Magnetic particles test	Visual	100%			CMTC	B	K	P	W	N		
11.6	Hardness	Mechanical	1/lot			CMTC	B	K	P	W	N		
11.7	Surface coating visual check	Visual	100%			EM Records	A	J	S	W	N		
11.8	Surface coating thickness check	Measure	5/lot			EM Records	A	J	S	W	N		
12.0	DENSITY MONITOR SWITCH									E			
12.1	Visual Check	Visual	100%		No damage	CMTC	B	K	P	W	N		
12.2	Leakage at rated SF6 Pressure	Physical	100%	PLANT STANDARD As per approved GTP and Drawing of BSPTCL	PLANT STANDARD As per approved GTP and Drawing of BSPTCL	EM Record	A	J	T/U	W/Z	N		During routine testing of breaker
12.3	Set point checking at EM	Measure	100%	Mat.Spec. As per EM	Mat.Spec. As per EM	EM Record	A	J	T/U	W/Z	N	During routine testing of breaker	
12.4	H.V. Test (2kV for 1 minute)	Electrical	100%			CMTC	B	K	P	W	N		
13.0	MECHANISM HOUSING FAB., WIRED HOUSING & M.BOX									N			
13.1	Visual check	Visual	100%		No damage	CMTC	B	K	P	W	N		
13.2	Chemical Analysis for HR Sheet	Chemical	1/lot	Plant Drawings & Project Drawings	Plant Drawings & Project Drawings	CMTC	B	K	P	W	N		
13.3	Tensile Test for HR Sheet	Mechanical	1/lot	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W	N		
13.4	Yield Strength for HR Sheet	Mechanical	1/lot			CMTC	B	K	P	W	N		
13.5	Elongation for HR Sheet	Mechanical	1/lot			CMTC	B	K	P	W	N		
13.6	Bend Test for HR Sheet	Mechanical	1/lot			CMTC	B	K	P	W	N		
13.7	Thickness for HR Sheet	Measure	1/lot			CMTC	B	K	P	W	N		
13.8	Dimensions for Fab.Housing & M.Box	Measure	1/lot			CMTC	B	K	P	W	N		
13.9	Electrical Circuit check (for Wired Hsg + M.Box)	Electrical	100%	Plant Drawing & Project Drawing	Plant Drawing & Project Drawing	CMTC	B	K	P	W	N		



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Sr.No.	Components / Operations & Description of Test	Type of Check	Quantam of check / Sampling with basis	Reference documents	Acceptance norm	Format of record	Codes						Remarks
							1	2	3	4	5	6	
18.2	No load test	Electrical	100%			CMTC	B	K	P	W	N		
18.3	H.V. test	Electrical	100%			CMTC	B	K	P	W	N		
19.0	TRIP & CLOSE COILS										E		
19.1	Coil Resistance	Electrical	100%	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	CMTC	B	K	P	W	N		
19.2	HV Test (2 KV for 1 minute)	Electrical	100%	Mat.Spec. As per EM	Mat.Spec. As per EM	CMTC	B	K	P	W	N		
19.3	Insulation Resistance	Electrical	100%			CMTC	B	K	P	W	N		
20.0	Section B : Inprocess Inspection FABRICATION												
20.1	Visual Check	Visual	100%		No damage	EM Record	A	J	S	W	N		
20.2	Dimensional Check	Measure	100%	Plant Drawing	Plant Drawing	EM Record	A	J	S	W	N		
21.0	Painting												
21.1	Visual	Visual	100%		No damage	EM Record	A	J	S	W	N		
21.2	Thickness	Measure	1/lot	Plant Standard As per approved GTP and Drawing of BSPTCL	Plant Standard As per approved GTP and Drawing of BSPTCL	EM Record	A	J	S	W	N		
22.0	Mech frame Machining												
22.1	Visual	Visual	100%		No damage	EM Record	A	J	S	W	N		
22.2	Dimension	Measure	2/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	EM Record	A	J	S	W	N		
23.0	PUFFER CYLINDER												
23.1	Silver plating thickness	Measure	1/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	EM Record	A	J	S	W	N		
23.2	Adhesion of silver plating	Physical	1/lot	Plant Drawing As per approved GTP and Drawing of BSPTCL	Plant Drawing As per approved GTP and Drawing of BSPTCL	EM Record	A	J	S	W	N		
24.0	ASSEMBLY OF BREAKER												
24.1	Intrrupter Assembly	Visual Measure	100%	Plant Drawings Plant Standards	Plant Drawings Plant Standards	EM Record	A	J	S	W	N		
24.2	Mechanism Assembly	Visual	100%	Plant Drawings	Plant Drawings	EM Record	A	J	S	W	N		



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24.3	Wiring Assembly	Measure Visual	100%	Plant Standards Plant Drawings	Plant Standards Plant Drawings	EM Record	A	J	S	W	N		
24.4	Main Assembly	Measure Visual	100%	Plant Standards Plant Drawings	Plant Standards Plant Drawings	EM Record	A	J	S	W	N		
24A	Zinc - Nickel Plating for mechanism housing components (when applicable)	Measure		Plant Standards	Plant Standards								
24B	Visual	Visual	100 %	Plant standard As per type test Plant drawings	Plant standard As per type test Plant drawings	EM Record	A	J	S	W	N		
	Thickness	Measure	1/lot	Plant standard As per type test Plant drawings	Plant standard As per type test Plant drawings	EM Record	A	J	S	W	N		
	Visual	Visual	100 %	Plant standard As per type test Plant drawings	Plant standard As per type test Plant drawings	EM Record	A	J	S	W	N	Li grease shall be applied on surfaces at the time of despatch	
	Thickness	Measure	1/lot	Plant standard As per type test Plant drawings	Plant standard As per type test Plant drawings	EM Record	A	J	S	W	N	The same will be followed till Zinc-Nickel plating procedure implemented	
25.0	Section C : Final Testing *												
25.1	ROUTINE TEST Mechanical operations at Rated SF6 gas pressure at 20°C	Electrical Mechanical	100% / 10 %	IEC - 62271-100 & BSPTCL Specification	IEC - 62271-100 & BSPTCL Specification	EMTC	A	J	T/U	W/Z	Y		
a)	At 100% V 5 - Closing												
b)	5- Opening At 120% V 5 - Closing												
c)	5- Opening At 70% V												
d)	5 - Opening At 85% V												
e)	5 - Closing At 100% V 5 - CO & 5 - O-C operations to be controlled by sequence controller or												



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							1	2	3	4	5	6		
f)	operational analyzer At 50% V One opening													
25.2	Measurement of speed and time (Curves to be obtained by operational analiser)	Electrical Mechanical	100% / 10 %			EMTC	A	J	T/U	W/Z	Y			
a)	At 100% V Opening Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
b)	At 100% V Closing Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
c)	At 120% V Opening Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
d)	At 120% V Closing Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
e)	At 70% V Opening Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
f)	At 85% V Closing Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets									
g)	At 100% V O-CO Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets (Reclosing Time) Initiation of opening coil in first O to contact close time less than 300ms during O-CO operation									
h)	At 100% V CO Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets T- 60 ms (Max.) T= contact touch in close operation to contact separation in subsequent opening									
i)	At 120% V CO Operation			BSPTCL approved Data Sheets	BSPTCL approved Data Sheets T- 60 ms (Max.) T= contact touch in close operation to contact separation in subsequent opening									



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Sr.No.	Components / Operations & Description of Test	Type of Check	Quantam of check / Sampling with basis	Reference documents	Acceptance norm	Format of record	Codes						Remarks
							1	2	3	4	5	6	
j) 25.3	At 85% V CO Operation MV drop (Contact resistance)	Electrical	100% / 10 %	BSPTCL approved Data Sheets IEC - 62271-100 BSPTCL Specification & Approved data sheet	BSPTCL approved Data Sheets T- 60 ms (Max.) T= contact touch in close operation to contact separation in subsequent opening IEC - 62271-100 BSPTCL Specification & Approved data sheet and valid type test value	EMTC	A	J	T/U	W/Z	Y		
25.4	Dynamic Contact Resistance Measurement	Electrical	100% / 10 %	BSPTCL Specification	BSPTCL Specification	EMTC	A	J	T/U	W/Z	Y		
25.5	Gas Leakage	Physical	100% / 10 %	IEC - 62271-100 BSPTCL Specification & Approved data sheet	IEC - 62271-100 BSPTCL Specification & Approved data sheet Max. 0.02cc/hr/joint (max. 10ppm)	EMTC	A	J	T/U	W/Z	Y		
25.6	ELECTRICAL SEQUENCE CHECK	Electrical	100% / 10 %			EMTC	A	J	T/U	W/Z	Y		
a)	Pole discrepancy / Emergency tripping												
b)	Antipumping			BSPTCL Specification	BSPTCL Specification								
c)	Other A.C.Circuit check			BSPTCL Specification / Appd. Drawing	BSPTCL Specification / Appd. Drawing								
25.7	Stored energy test	Electrical & Mechanical	100% / 10 %	BSPTCL Approved Data Sheets	BSPTCL Approved Data Sheets O-C-O (min)	EMTC	A	J	T/U	W/Z	Y		
25.8	Wiring Check	Visual	100% / 10 %	BSPTCL Approved Drawing	BSPTCL Approved Drawing	EMTC	A	J	T/U	W/Z	Y		
25.9	A) Stroke of operation mechanism	Measure	100% / 10 %	BSPTCL Approved Data Sheets	BSPTCL Approved Data Sheets	EMTC	A	J	T/U	W/Z	Y		
	B) Wipe	Measure		BSPTCL Approved Data Sheets	Min.-95mm Max. - 101mm BSPTCL Approved Data								



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN-- SF6 GAS CIRCUIT BREAKER

		Customer BSPTCL	Vendor's Code:	Item : 72.5 KV / 145KV/245KV SP- SP SF6 GAS CIRCUIT BREAKER	Q.P. NO. 010 Rev. No. 00 Date : 02.01.16	Valid From : 15.01.2016 Valid Upto : Till Revision
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Sr.No.	Components / Operations & Description of Test	Type of Check	Quantam of check / Sampling with basis	Reference documents	Acceptance norm	Format of record	Codes						Remarks
							1	2	3	4	5	6	
25.10	2 kV Test on i) Control circuit ii) Aux. Circuit	Electrical	100% / 10 %	IEC - 62271-100 & BSPTCL Specification	IEC - 62271-100 & BSPTCL Specification Should withstand 2 kV for 1 minute	EMTC	A	J	T/U	W/Z	Y		
25.11	Checks on drive units	Electrical	100% / 10 %	BSPTCL Approved Data Sheets	BSPTCL Approved Data Sheets Coil resistance trip coil & close coil	EMTC	A	J	T/U	W/Z	Y		
25.12	Verification of setting of density monitor switch at CGL	Electrical	100% / 10 %	BSPTCL Approved drawing	BSPTCL Approved drawing	EMTC	A	J	T/U	W/Z	Y		
25.13	HV test	Electrical	100% / 10 %	IEC - 62271-100 & BSPTCL Specification.	IEC - 62271-100 & BSPTCL Specification.Should 275 kV for 145 kV 460 kV for 245 kV for 1 minute	EMTC	A	J	T/U	W/Z	Y		
a)	Between contacts (Breaker in open condition)												
b)	Between live parts to ground (Breaker in closed condition)			IEC - 62271-100 & BSPTCL Specification.	IEC - 62271-100 & BSPTCL Specification.Should 275 kV for 145 kV 460 kV for 245 kV for 1 minute								



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Sr.No.	Components / Operations & Description of Test	Type of Check	Quantam of check / Sampling with basis	Reference documents	Acceptance norm	Format of record	Codes						Remarks
							1	2	3	4	5	6	
26	Section D : Packing & Dispatch												
26.1	Visual	Visual	100%	EM Check list	EM Check list	EM Record	A	J	S	W		N	
26.2	Verification of Completeness	Visual	100%	EM Check list	EM Check list	EM Record	A	J	S	W		N	
26.3	Check of Dispatch Instructions/Clearance Despatch Authorization reference of packing / Packing list	Visual	100%	Dispatch Instructions/Clearance Authorization	Dispatch Instructions/Clearance Authorization	EM Record	A	J	S	W		N	

* Samples of Witnessing : T - 75%, U - 25%.



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN-- SF6 GAS CIRCUIT BREAKER

		Customer BSPTCL	Vendor's Code:	Item : 145KV/245KV SF6 GAS CIRCUIT BREAKER	Q.P. NO. 010 Rev. No. 00 Date: 02.01.2016	Valid From : 15.01.2016 Valid Upto : Till Revision
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List of Component Manufacturer for which make approval is envisaged.

Sr. No.	Component	Component Manufacturer	Place
1	Interrupter & Support Insulators	Insulators and Electricals Co Ltd Aditya Birla Nuvo Ltd (JayaShree Insulators)(Birla NGK Insulators Pvt Ltd.) Modern Insulators Ltd WS Insulators Liling Huaxin Porcelain Insulator & Electric Apparatus Co. Ltd. Liling Pukou Insulator Manufacture Co. Ltd	Mandideep,Bhopal Halol Abu Road Chennai China China
2	Insulating Tubes	Permal Wallance Pvt Ltd Hitein Bushing (P) Ltd	Bhopal Pune
3	Puffer Cylinder - Aluminium Pipes	Sudershan Aluminium Jindal Aluminium Hindalco IndustriesLtd	Nasik Bangalore Cochin /Kalamassery
4	Stationary & Moving Arc Contacts	Modison Metals Ltd	Vapi
5	Stationary, Moving & Fixed Finger Contacts	Modison Metals Ltd Rapsri Engg	Vapi Bangalore
6	Nozzles	Duflon Polymer (P) Ltd	Mahad,Raigad
7	Contactors	Schiender India Ltd	Nashik
8	Gas Pressure Gauges	Wika instrument India Pvt Ltd	Pune
9	Sealings ('O' Rings)	Tominaga Boeki kaisha Ltd(Mitsubishi cable industries Ltd) Parker Hannifin Corp.	Japan USA
10	Springs	Coventry Springs and Engg Co ltd Gartels Werke Ltd Turton Springs Ltd.	Nagpur Umbergaon UK
11	Density Monitor Switches	Saginomiya seisakusho Wika instrument India Pvt Ltd	Japan Pune
12	SF6 Gas	Inox India ltd Solvey -Germany (KPL international) Kanto Denka Kogyo Honeywell -USA (Stallion Enterprises)	Mumbai Delhi Japan Panwel
13	Gas Stop Valves (DILO)	Sameer Linkages Pvt Ltd	Vadodara
14	Universal Motors	Kulkarni Power Tools (P) ltd	Shirol,Kolhapur
15	Trip & Close Coils	Electrical Controls & Systems Mascasts	Vadodara Mumbai