



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- PVC CONTROL CABLE

	MANUFACTURERS DETAILS	Customer	Vendor's Code	Item:	MQP No : 007	Valid From:	15.01.2016
		BSPTCL		1.1 KV GRADE PVC CONTROL CABLE	Rev. No. 00	Valid Upto:	Till Revision
					Date 02.01.2016	Page: 1 of 27	
Code 1	Indicates place where testing is planned to be performed i.e. Inspection Location			Code 2	Indicate who has to perform the tests i.e. Testing Agency		
A	At Equipment Manufacturer's works			J	Manufacturer		
8.4				IS:5831 & BSPTCL	IS:5831 & BSPTCL		
B	At Component Manufacturer's works			Specification.	Specification.		
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				IS:209 & BSPTCL		
				IS:5831 & BSPTCL	specification		
	Indicates place who shall witness tests i.e. Witnessing			Specification.	Review of Test		
Code 3	Agency			Code 4	Reports/Certificates		
				IS:613 & BSPTCL	IS:613 & BSPTCL		
P	Component Manufacturer itself			Specification	Specification		
Q	Component Manufacturer and Equipment Manufacturer			X	By Contractor during product/process inspection		
	Component Manufacturer, Equipment Manufacturer and						
R	Contractor			Y	BY BSPTCL during product/process inspection		
					By Contractor and/or BSPTCL during product/process		
S	Equipment Manufacturer itself			Z	inspection.		
	make is envisaged?			Code 6	for issuance of Dispatch Instrcutions/Clearance		
E	Envisaged			Y	Yes		
N	Not Envisaged			IS:5831 & BSPTCL	IS:5831 & BSPTCL		
				Specification	Specification		
				IS:5831 & BSPTCL	IS:5831 & BSPTCL		
				Specification.	IS:5831 & BSPTCL Specification.		



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- PVC CONTROL CABLE

MANUFACTURERS DETAILS	Customer	Vendor's Code	Item:	MQP No : 007	Valid From:	15.01.2016
	BSPTCL		1.1 KV GRADE PVC CONTROL CABLE	Rev. No. 00	Valid Upto:	Till Revision
				Date 02.01.2016	Page: 2 of 27	
a.	The MQP should be read in conjunction with BSPTCL specification and shall deem to include additional tests if any required as per the contract.					
b.	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.					
c.	In case of any contradiction between the manufacturer's plant standards, this MQP and BSPTCL specification following precedence shall be followed :- i) BSPTCL specification ii) This MANUFACTURING QUALITY PLAN -- PVC CONTROL CABLE -- PVC CONTROL CABLE. iii) Manufacturer's plant standards					
d.	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.					
e.	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 available during inspection by BSPTCL.					
h.	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.					
i.	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.					
j.	One copy of test report, Dispatch Instructions/Clearance shall also be sent along with consignment.					

k	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 specification / Relevant-Indian / International Specification
l	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.
m	All raw materials where vendor approval is envisaged to be supplied from BSPTCL approved vendors.
n	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.
o	The manufacturer shall adopt such a quality system/practice so as to ensure 100% conformity of all the input material as per technical specification/ standard requirements.



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- PVC CONTROL CABLE

	MANUFACTURERS DETAILS	Customer	Vendor's Code	Item: 1.1 KV GRADE PVC CONTROL CABLE	MQP No : 007	Valid From:		15.01.2016
		BSPTCL			Rev. No. 00	Valid Upto:		Till Revision
					Date 02.01.2016	Page: 4 of 27		
<p>p) All the Copper wire strands and galvanized steel wire/ strips are required to be tested for each sample drawn for acceptance tests</p> <p>q) Strips/ wire armouring following method (a) mentioned in relevant IS 1554(I) shall not be acceptable to BSPTCL.</p> <p>r) For single core armoured cables, armouring should be of aluminium wire instead of galvanised steel wire/ strip.</p> <p>s) The filler and innersheath shall be of non-hygroscopic fire retardant materials and shall be softer than insulation.</p> <p>t) The manufacturer shall not offer repaired cables for inspection under no circumstances.</p> <p>u) The contractor shall obtain the following test certificates from their subvendor for various raw materials for review by BSPTCL.</p> <p style="margin-left: 20px;">i) Chemical composition of Copper wire/rod.</p> <p style="margin-left: 20px;">ii) Purity of Zinc</p> <p style="margin-left: 20px;">iii) All the test results of the tests carried out by their sub vendor on copper wire rod/ copper wire/XLPE Compound for insulation, PVC Compound. for inner and outer sheath and galvanised steel wire/ strips.</p> <p>v) The cable ends shall be properly sealed with PVC/ rubber caps and secured with the help of U nails on the side of one of the flange using galvanised steel wire at three locations 75mm apart or more covered with PVC Adhesive tape.</p> <p>w) The following test facilities/ calibration certificates shall be available at contractors work.</p> <p style="margin-left: 20px;">i) Calibration of all testing and measuring equipments.</p> <p style="margin-left: 20px;">ii) Standard Resistance.</p> <p>conductor line with clause 6.1.2.2 of IS 8130-1984.</p> <p>z) In addition to the requirement indicated at serial no 14.1.1 (v) the manufacturer shall get verified the length of 10% of the drums offered by rewinding irrespective of the sizes at the time of final inspection. If by rewinding Specification Specification</p> <p>otherwise the lot will be accepted with the modification of declared length of original drums.</p>								

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	
1.6	Visual Check for PVC granules i.e. burns etc	Visual	One sample per lot of 5 MT or part thereof	IS:5831 & BSPTCL Specification. be generally free from burn particles	IS:5831 & BSPTCL Specification. be generally free from burn particles	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
1.7	Tensile strength and elongation before aging	Mech	One sample per lot of 5 MT or part thereof	IS:5831 & Approved Specification. Elongation 150%	IS:209 & BSPTCL specification TS-12.5 N/mm2 Elongation 150%	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
1.8	Tensile strength and elongation after aging	Mech	One sample per lot of 5 MT or part thereof	IS:5831 & Approved Data Sheets. Min. TS-12.5 N/mm2 Max. variation $\pm 20\%$ from the actual aging.	IS:5831 & Approved Data Sheets. Min. TS-12.5 N/mm2 Max. variation $\pm 20\%$ from the actual aging.	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
1.9	Loss of Mass in air oven	Therm	One sample per lot of 5 MT or part thereof	IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.

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	
1.16	Oxygen Index Test on PVC for outer sheath only.	Envir.	One sample per lot of 5 MT or part thereof	IS:5831 & BSPTCL Specification. sheets Min. 29%	IS:5831 & BSPTCL Specification. sheets Min. 29%	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
1.17	Temperature Index Test on PVC for Outer Sheath only.	Envir.	One sample per lot of 5 MT or part thereof	ASTM-D-2863 & IS:5831 & BSPTCL Specification. Deg.C	IS:209 & BSPTCL specification sheets Min. 250 Deg.C	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
2.0	ARMOUR WIRE/STRIP			IS:613 & BSPTCL Specification	IS:613 & BSPTCL Specification						E		
2.1	DIMENSION	Meas.	One Sample for every 10 coils	IS:3975 & Approved Data Sheets	IS:3975 & Approved Data Sheets	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
2.2	Elongation	Mech	One Sample for every 10 coils	IS:3975 & Approved IS:5831 & BSPTCL Specification	IS:3975 & Approved IS:5831 & BSPTCL Specification	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.
2.3	Torsion/Winding	Mech	One Sample for every 10 coils	IS:3975 & Approved Data Sheets	IS:3975 & Approved Data Sheets	Manuf. T.C./RM TEST REPORT	A	J	S	W		N	Review of manufacturer's TCs or the records of the contractor at the time of final inspection.

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	
5.4	Diameter	Meas.	Each setting during Process	IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.
6.0 INNER SHEATHING BY EXTRUSION													
6.1	Thickness of inner sheath	Meas.	Each setting during Process	IS:5831 & BSPTCL Specification. Table-4 & approved IS:613 & BSPTCL Specification	IS:1554(Part-1) Table-4 & approved IS:613 & BSPTCL Specification	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.
6.2	Dia over Inner Sheath	Meas.	Each setting during Process	Approved data sheet	Approved data sheet	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.
6.3	Type of Sheathing Material	Visual	Each setting	IS:1554(Part-1) & smooth & free from any defects. IS:5831 & BSPTCL Specification	IS:1554(Part-1) & smooth & free from any defects. IS:5831 & BSPTCL Specification	Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.
7.0 ARMOURING													
7.1	No. of armour wires & construction	Meas.	Starting of M/C and during running	IS:5831 & BSPTCL Specification. approved data sheet	IS:5831 & BSPTCL Specification. approved data sheet	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.



BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

MANUFACTURING QUALITY PLAN -- PVC CONTROL CABLE

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																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">MANUFACTURERS DETAILS</td> <td style="width: 15%;">Customer</td> <td style="width: 15%;">Vendor's Code</td> <td style="width: 15%;">Item:</td> <td style="width: 15%;">MQP No : 007</td> <td style="width: 10%;">Valid From:</td> <td style="width: 20%; text-align: center;">15.01.2016</td> </tr> <tr> <td></td> <td style="text-align: center;">BSPTCL</td> <td></td> <td style="text-align: center;">1.1 KV GRADE PVC CONTROL CABLE</td> <td>Rev. No. 00</td> <td>Valid Upto:</td> <td style="text-align: center;">Till Revision</td> </tr> <tr> <td colspan="5"></td> <td>Date 02.01.2016</td> <td style="text-align: center;">Page: 17 of 27</td> </tr> </table>							MANUFACTURERS DETAILS	Customer	Vendor's Code	Item:	MQP No : 007	Valid From:	15.01.2016		BSPTCL		1.1 KV GRADE PVC CONTROL CABLE	Rev. No. 00	Valid Upto:	Till Revision						Date 02.01.2016	Page: 17 of 27							
MANUFACTURERS DETAILS	Customer	Vendor's Code	Item:	MQP No : 007	Valid From:	15.01.2016																												
	BSPTCL		1.1 KV GRADE PVC CONTROL CABLE	Rev. No. 00	Valid Upto:	Till Revision																												
					Date 02.01.2016	Page: 17 of 27																												
7.2	Dimensions of Armour Wire/strip	Meas.	Starting of M/C and during running	IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.																					
7.3	Surface Finish	Visual	Starting of M/C and during running	Should be reasonably IS:5831 & BSPTCL Specification.	Should be IS:209 & BSPTCL specification	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.																					
7.4	Lay Direction	Visual	Starting of M/C and during running	Left hand lay IS:613 & BSPTCL Specification	Left hand lay IS:613 & BSPTCL Specification	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.																					
7.5	Gap between two wires/strip	Meas.	Starting of M/C and during running	Not more than one wire dia. / width of strip.	Not more than one wire dia. / width of strip.	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.																					
			and during running	No face bend	No face bend								contractor at the time of final inspection.																					
7.6	Dia over Armour	Meas.	Starting of M/C and during running	IS:5831 & BSPTCL Specification	IS:5831 & BSPTCL Specification	In Process Log Sheet	A	J	S	W		N	Review of the records of the contractor at the time of final inspection.																					

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	
10.0	FINAL INSPECTION & TESTING			IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.								
11.0	ROUTINE TESTING												
11.1	Conductor resistance at 20°C	Elect	100% Drums	IS:8130 Table-2 / IS:5831 & BSPTCL Specification.	IS:209 & BSPTCL specification	Routine Test Certificate	A	J	U	Y		N	Review of the records of the contractor at the time of final inspection.
11.2	High Voltage Test at room temperature	Elect	100% Drums	IS:613 & BSPTCL Specification (r.m.s.) for 5 Minute	IS:613 & BSPTCL Specification (r.m.s.) for 5 Minute	Routine Test Certificate	A	J	U	Y		N	Review of the records of the contractor at the time of final inspection.
12.0	ACCEPTANCE TESTS												
12.1	FINISHED CABLE												
	of sequential marking check												
	Surface finish												
	Top & Bottom sequential marking check			IS:5831 & BSPTCL Specification	IS:5831 & BSPTCL Specification								
	Length Measurement	Verification through rewinding, 10% of t		IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.								
12.2	High Voltage test at room temperature	Elect	100% Drums	IS:1554(Part-1)/ BSPTCL Specifi- cation shall with- stand 3 KV (r.m.s.) for 5 minutes.	IS:1554(Part-1) / BSPTCL Specifi- cation shall with- stand 3 KV (r.m.s.) for 5 minutes.	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.

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	
13.2	Thickness of Inner Sheath	Meas.	1 sample for every 10 drums or part thereof per size	IS:5831 & BSPTCL Specification. data sheets.	IS:5831 & BSPTCL Specification. data sheets.	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch
13.3	Thickness of Outer Sheath	Meas.	1 sample for every 10 drums or part thereof per size	IS:1554(Part-1) Specification. data sheets.	IS:209 & BSPTCL specification data sheets.	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
13.4	Tensile Strength & Elongation for Insulation	Mech	1 sample for every 10 drums or part thereof per size	Specification Approved data sheets. Min. TS 12.5 N/mm2. Elongation 150% (Min.)	Specification Approved data sheets. Min. TS 12.5 N/mm2. Elongation 150% (Min.)	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
13.5	Cold Bend Test for all diameter Cables	Mech	1 sample of any size per order	Specification IS:5831 & BSPTCL Specification.	Specification IS:5831 & BSPTCL Specification.	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
13.6	Cold Impact test for diameter more than 12.5 mm	Mech	1 sample of any size per order	IS:1554(Part-1). No signs of cracks or scales	IS:1554(Part-1). No signs of cracks or scales	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.

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	
13.7	Oxygen Index test on outer sheath	Envir.	1 sample per lot for each size	IS:5831 & BSPTCL Specification. Min. 29%	IS:5831 & BSPTCL Specification. Min. 29%	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch
13.8	Temperature Index test on outer sheath	Envir.	1 sample per lot for each size	ASTMD-2863 / approved data sheet IS:5831 & BSPTCL Specification.	ASTMD-2863 / IS:209 & BSPTCL specification	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
13.9	Flame Retardant test on single core cables	Thermal	1 sample per lot for each size	IS:1554 Cl. 16.6 IS:613 & BSPTCL Specification specimen within 300 mm from its upper end	IS:1554 Cl. 16.6 IS:613 & BSPTCL Specification specimen within 300 mm from its upper end	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
14.0 ADDITIONAL TESTS FOR													
14.1	Acid Gas Generation	Envir.	1 sample per lot for each size	IEC-754-1 /Power IS:5831 & BSPTCL Specification IS:5831 & BSPTCL	IEC-754-1 /Power IS:5831 & BSPTCL Specification IS:5831 & BSPTCL	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
14.2	Flamability Test	Thermal	1 sample per lot for each size	Specification. Chimney SS-424-14 -75 class-F3 / approved data sheet	Specification. Chimney SS-424-14 -75 class-F3 / approved data sheet	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.

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	
15.4	Weight of Zinc Coating	Chem	1 sample per every 10 drums or part thereof	IS:5831 & BSPTCL Specification.	IS:5831 & BSPTCL Specification.	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
15.5	Torsion/Winding	Mech	1 sample per every 10 drums or part thereof per size	IS:3975 / approved data sheets. IS:5831 & BSPTCL Specification.	IS:3975 /approved IS:209 & BSPTCL specification	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
16	DRUMS			IS:613 & BSPTCL Specification	IS:613 & BSPTCL Specification								
16.1	Visual check for defects	Visual	100%	BSPTCL Specification	BSPTCL Specification	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
16.2	Dimensions	Meas.	1 sample per every 10 drums or	Approved drawings	Approved drawings	Acceptance Test Certificate	A	J	U	Y		Y	Dispatch Instructions/Clearance.
	Physical test for insulation and outer sheath												
16.3	Shrinkage Test	Meas.	1 Sample/Lot/Type	BSPTCL specs/As Per IS 1554(Part-1)	BSPTCL specs/As Per IS 1554(Part-1)	Test Report	A	J	U	Y		Y	Dispatch Instructions/Clearance.
16.4	Hot Deformation Test	Meas.	1 Sample/Lot/Type	Specification	Specification	Test Report	A	J	U	Y		Y	Dispatch Instructions/Clearance.
16.5	Heat Shock Test	Meas.	1 Sample/Lot/Type	Specification.	Specification.	Test Report	A	J	U	Y		Y	Dispatch Instructions/Clearance.
16.6	Thermal Stability	Meas.	1 Sample/Lot/Type	BSPTCL specs/As Per IS 1554(Part-1)	BSPTCL specs/As Per IS 1554(Part-1)	Test Report	A	J	U	Y		Y	Dispatch

