

#### MANUFACTURING QUALITY PLAN -- OPGW

	Name of Manufacturer :		Vendor's Code	ITEM :FO Approach Cable	M.Q.P No :38	Valid From: 15.01.2016
		Customer :			Rev No: 00	Valid Up to: Till Revision
		BSPTCL				
Code 1 Inc	licates Place where testing is planned to be				Code 2 Indicates who has to perform the tests	5
performed	i.e. Inspection Location				i.e. Testing agency	
A At Equ	ipment manufacturer's works				J The Equipment manufacturer	
B At con	nponent manufacturer's works				K The Component manufacturer	
C At aut	horized distributor's place				L The third party	
D At ind	ependent Lab				M Theturnkey contractor	
E At tur	nkey contractor's location					
F Not Sp	ecified					
Code 3 In	dicates who shall witness the tests i.e.					
Witnessing	agency				Code 4 Review of Test Reports/ Certificates	
P Comp	oonent Manufacturer itself				W By Equipment Manufacturer during raw	material/bought out
Q Comp	onent Manufacturer and Equipment Manufactu	rer			component inspection	
R Comp	onent Manufacturer, Equipment Manufacturer	and Contractor			X By Contractor during Product/ Process	nspection
S Equip	ment Manufacturer itself				Y By BSPTCL during Product/ Process Insp	ection
T Equip	ment Manufacturer and Contractor				Z By Contractor and/or BSPTCL during Pro	oduct/Process
U Equip	oment Manufacturer, Contractor and BSPTCL				Inspection	
	Party itself					
Code 5 V	Whether specific approval of sub-vendor/ Comp	onent make is Envisage	d?		Code 6 Whether test records required to be s	submitted after issuance of Dispatch
E	Envisaged				Clearance / Instructions ?	
N	Not Envisaged				Y Yes	
					N No	
	and Onder Dis Discordals Instancedies					

PO: Purchase Order, DI: Dispatch Instruction.

#### 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 purchase order, 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 sub vendors control, metering & testing instruments are duly calibrated and should have calibration certificates traceable to Indian/ National standards. Calibration records should be available during inspection of BSPTCL. Calibration of Testing instrument should be carried out in a lab which is accredited by NABL or an agency having full membership & MRA of ILAC/APLAC with upto date validity
- 6. In case of any tests being carried out at third party lab, such lab/ facility should be accredited/ accepted by BSPTCL
- 7. The manufacturer shall maintain the proper co-relation of test certificates from raw material stage to finished stage and the records should be available during BSPTCL inspection.



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	BSPTCL				1

- 8. The; Manufacturer shall show the approval of BSPTCL engineering for all contracts specific type tests, including specific type tests if any as per the BSPTCL specification at the time of final inspection.
- 9. All packing cases should be marked with BSPTCL LOA details, name of project, item description and Dispatch Clearance / Instructions number( by which material has been cleared for dispatch.
- 10. One copy of test report, Dispatch Clearance / Instructions shall also be sent along with the consignment.
- 11. Inspection of spares ordered by BSPTCL shall also be governed by provisions of this MQP. Items if not governed under MQP shall be offered for inspection as per the BSPTCL specifications/ Relevant Indian/ International specifications.
- 12. The manufacturer shall align their Quality System and that of their Sub vendors of latest ISO 9000 Quality standards.
- 13. In case of Change of name of sub vendor the manufacturer shall submit request to update the same along with supporting documents.
- 14. Whenever Indian / International standard are referred their last amendment shall be included.
- 15. Raw material / bought out items (envisaged) shall be procured from Approved source only.
- 16. All Out sourced services' shall be from approved source only.
- 17. Surveillance checks shall be carried out by BSPTCL sources as and when deemed necessary no inspection call to be given for surveillance check.
- 18. BSPTCL may review the effective implementation of the processes during the product inspection / process inspection. In case any violations in process or process parameters are observed, the reason along with corrective & preventive, measure shall beconveyed to BSPTCL within 2 weeks.

#### Section A Raw Materials

SI.No.	Components /	Type of Check		Reference	Acceptance Norms	Format of Record			Applical	ble Codes			Remarks
i	Operations &			document for									
	Description of Test			Testing									
			Quantum of Check /										
			Sampling with basis										
							<u> </u>	г	1		1		
							1	2	3	4	5	6	
1.1 Optica	l Fibre						ı			I		I	E
					BSPTCL Approved	Supplier Test	В	K	Р	W		N	
					Drawing and	Certificate							
			100% of fibers		Specifications								
	Attenuation												
1.1.1	Coefficient	Measurement		IEC 60793-1-40									
					BSPTCL Approved		В	K	P	w		N	
			100% of fibers		Drawing and Specifications	Certificate							
	Point Discontinuity				Specifications								
1.1.2	of Attenuation	Measurement		IEC 60793-1-40	1		1						



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	Name of Manufacturer :		Customer : BSPTCL	Vendor's Code	ITEM :FO Approach C	able	M.Q.P No:				Valid From : Valid Up to:		
	Chromatic		100% of fibers		BSPTCL Approved Drawing and Specifications	Supplier Test Certificate	В	К	P	w		N	
1.1.3	Dispersion	Measurement		IEC 60793-1-42									
			100% of fibers		BSPTCL Approved Drawing and Specifications	Supplier Test Certificate	В	К		w		N	
1.1.4	Mode Field Diameter Fiber Cutoff	Measurement	100% of fibers	IEC 60793-1-45	BSPTCL Approved Drawing and Specifications	Supplier Test Certificate)	В	К	P	w		N	
1.1.5	Wavelength	Measurement		IEC 60793-1-44									
	Fiber Geometry (core clad concentricity error and Cladding		100% of fibers		BSPTCL Approved Drawing and Specifications	Supplier Test Certificate)	В	К	P	W		N	
1.1.6	diameter)  Fiber Tensile proof test	Measurement  Measurement	100% of fibers	BSPTCL technical specification	BSPTCL Approved Drawing and Specifications	Supplier Test Certificate)	В	к	P	w		N	
					Section A Raw Mat	erials							
1.2 lnk								E	<u> </u>				
1.2.1	Color	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
1.2.2	Viscosity	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	Р	w		N	



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	Name of Manufacturer :		Customer : BSPTCL	Vendor's Code	ITEM :FO Approach C	Cable	M.Q.P N Rev No:				Valid From : Valid Up to:		
	l				Section A Raw Mat	erials							
3 Jelly									E				
.3.1	Flash Point	Measurement	EM Specs.	BSPTCL technical specification	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
3.2	Drop point	Measurement	EM Specs.	BSPTCL technical specification	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	Р	w		N	
3.3	Cone Penetration Test @ 25 <sup>0</sup> C	Measurement	EM Specs.	BSPTCL technical specification	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
3.4	Cone Penetration Test @ -40°C	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
3.5	Oil seperation at 100°C	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	Р	W		N	
4500					Section A Raw Mat	erials			_				
4 FRP	T	ı		Test certificate	BSPTCL Approved	Supplier TC	- In		E In	lw			ı
4.1	Diameter /Min bend diamter	Measurement	EM Specs.	from supplier	Drawing and Specifications	Supplier 1C	В	K	P	W		N	
4.2	Tensile strength at Break	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
4.3	Elongation at break	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	w		N	
4.5	Wter absorption after 24Hrs	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	w		N	
.4.6	Tensilemodulous ,Flexural strength,Flexurel modulous	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	w		N	



# BIHAR STATE POWER TRANSMISSION COMPANY LIMITED

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	Name of Manufacturer :		Customer : BSPTCL	Vendor's Code	ITEM :FO Approach C	able	M.Q.P No: (				Valid From Valid Up to:		
1.4.7	Heat stress,Hydrogen generation	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
1.4.8	Coefficient of Thermal expansion	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	Р	W		N	
					Section A Raw Mate	erials							
1.5 ECCS	Таре								E				
1.5.1	Thickness	Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
1.5.2		Measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	
1.5.3	Coating to steel Adhesion sterngth	measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	w		N	
1.5.4	Elongattion at break	measurement	EM Specs.	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	Supplier TC	В	К	P	W		N	



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	Name of Manufacturer :	1		Vendor's Code	ITEM :FO Approach Ca	ble	M.Q.P N	o :38			Valid From	: 15.01.201	6
			Customer :				Rev No:	00			Valid Up to	: Till Revisio	n
			BSPTCL										
					Section A Raw Mate	rials	1						
1.6 HDPE	(High Density Poly Eth	vlene)			Ocolion A Raw male	iluio			E				
	1	1		Test certificate	BSPTCL Approved		В	K	P	W		N	
			EM Specs.	from supplier	Drawing and								
4.6.4	Damaitu		EW Specs.		Specifications	CTC							
1.6.1	Density	Measurement		T	DCDTCI Ammend	Supplier TC		1,		100			
				Test certificate from supplier	BSPTCL Approved Drawing and		В	ĸ	Р	w		N	
			EM Specs.	nom supplier	Specifications								
1.6.2	Melt flow index	Measurement				Supplier TC							
				Test certificate	BSPTCL Approved		В	K	Р	w		N	
			EM Specs.	from supplier	Drawing and								
1.6.3	Carbon black content	Measurement	Ем ореса.		Specifications	Supplier TC							
1.0.3	content	Weasurement		Toot contificate	BSPTCL Approved	Supplier 10		1/	P	w			
				Test certificate from supplier	Drawing and		В	ĸ	۲	VV		N	
			EM Specs.		Specifications								
1.6.4	Tensile strength	Measurement				Supplier TC							
				Test certificate	BSPTCL Approved		В	K	Р	W		N	
			EM Specs.	from supplier	Drawing and Specifications								
1.6.5	Elongation at break	Measurement			opcomoations	Supplier TC							
	_ionganon at broan	ouou.oo		Test certificate	BSPTCL Approved	опринен то	В	K	Р	w		N	
				from supplier	Drawing and		ľ	'`	ľ	"		``	
	Oxidation Induction		EM Specs.		Specifications								
1.6.6	time	Measurement				Supplier TC							
					Section B Inproce	SS							
040-1	ng Process (Coloring	C4)											
2.1 COIOTI	I Coloring	Stage)		Test certificate	Smooth	In process Test	1					1	
				from supplier		Report							
			100% of fibers			l -							
2.1.1	Appearance	Naked eye					Α	J	S	w		N	
						In process Test							
	Attenuation		100% of fibers			Report							
2.1.2	coefficient	Measurement		IEC 60793-1 -40	<0.35 dB/km @ 1310nm		Α	J	s	w		N	
					<0.21dB/km @1550nm								
					Section B Inproce	SS							



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	Name of Manufacturer :		Customer : BSPTCL	Vendor's Code	ITEM :FO Approach Ca		M.Q.P No : Rev No: 00				: 15.01.2010 : Till Revision	
2.2 Loose	Tube Buffer (Buffering	յ Stage)										
			10% sample per lot	Test certificate from supplier	Smooth	In process Test Report						
2.2.1	Appearance	Naked eye					Α	J	S	W	N	
			10% sample per lot	Test certificate from supplier	2.0 mm nominal	In process Test Report						
2.2.2	Diameters	Measurement					Α	J	s	w	N	
	Colour scheme of Loose tubs & optical fibers	Naked eye	10% sample per lot	Test certificate from supplier	BSPTCL Approved Drawing and Specifications	In process Test Report		J	s	w	N	
2.2.3	Tibers	Nakeu eye				In T	А	J	3	VV	N	
2.2.4	Attenuation coefficient	Measurement	100% of fibers	IEC 60793-1 -40	<0.35 dB/km @	In process Test Report	A	J	s	w	N	
					<0.21dB/km @1550nm							



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			BSPTCL				Kev 140. 00				valid op to.	. Till Kevisioi	•
2 2 Strand	ling Core (Loose tube I	uiffor etranding eta	ao)		Section B Inproce	SS							
2.5 Otrana	ing core (Loose tabe i	Julier Stranding Sta	] 	I		I							
	Attenuation Co-				<0.35 dB/km @								
	efficient.	Measurement	100% of fibers		1310nm								
				IEC 60793-1-	.0 24 dB/low @4550mm	In process Test							
2.3.1				40		Report In process Test	Α	J	S	W		N	
	Colour scheme of				Drawing and	Report							
	Loose tubs & optical		10% sample per lot	BSPTCL technical	Specifications								
2.3.2	fibers	Naked eye		specification			Α	J	s	w		N	
					I Inspection (Factory s on Final FG Fiber C	•	•						
				3.1 Routine test		Inprocess test	able						
			100 % of drums			Report							
			100 % of drains		<0.35 dB/km @ 1310nm								
					131011111								
	Attenuation				≤0.21dB/km @1550nm								
3.1.1	Coefficient	Measurement		IEC60793-1-40	C0.210B/KIII @1550IIII	FAT Report	Α	J	s	W		Υ	
			100% of drums			A Report							
	Attenuation At water			BSPTCL technical	Less than Attenuation								
3.1.2		Measurement		specification	@ 1310nm		Α	J	s	w		Υ	
						FAT Report							
			100% of drums										
3.1.3	Point Discontinuity	Measurement		IEC60793-1-40	<u>≤</u> 0.1 dB		Α	J	s	w		Υ	
			100 % of drums										
				BSPTCL Approved									
				Drawing and Specifications	10.5 <u>+</u> 5% mm								
3.1.4	Overall Diameter	Measurement				FAT Report	A	J	s	w		Υ	
*****						FAT Report		-	-				
			100 % of drums										
				BSPTCL Approved									
				Drawing and Specifications									
				opecinications									
3.1.5	Sheath Thickness	Measurement			1.6 mm Nominal		_	l.	s	w		v	
U. I.U	Oneau Interness	moasureillellt	1	1	1.0 mm Nomma	I	<u></u>	ř	٧.				



MANUFACTURING QUALITY PLAN OPGW    Name of Manufacturer:   Vendor's Code   ITEM:FO Approach Cable   M.Q.P. No: 38   Rev. No: 00   Valid From: 15.01.2016   Valid Up to: Till Revision													
	Customer :				ble	-							
				Section C Fina	al Inspection (Factory	Accepatone Te	est)						
					3.2 Completed FO C	able							
					1								
			10% of										
3.2.1		Measurement	lot	IEC60793-1-40	≤0.21dB/km @1550nm		A	J	U	z	N	Y	
			10% of			·							
3.2.2		Measurement	lot	specification	Less than Attenuation @ 1310nm		A	1.	U	z	N	Y	
<u> </u>	poun	modourement	10% of	- Specification	S 1010iiii	FAT Report			Ĭ		, a		
3.2.3	Point Discontinuity	Measurement	lot	IEC60793-1-40	<u>&lt;</u> 0.1 dB		Α	J	U	z	N	Υ	
			10% of	BSPTCL Approved Drawing and Specifications	10.5 <u>+</u> 5% mm								
3.2.4	Overall Diameter	Measurement	lot			FAT Report	Α	J	U	z	N	Υ	
			10% of	BSPTCL Approved Drawing and Specifications		FAT Report							
3.2.5	Sheath Thickness	Measurement	lot		1.6 mm Nominal		Α	J	U	z	N	Υ	



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			BSPTCL				Kev No. 00				valid op to	. Tili Kevisioi	•
				Section D Fin:	al Inspection (Factor	/ Accenatone Te	zt.						
				000		, riocopatono ro							
					4.1 Cable Drum								
			10%of										
				BSPTCL Approved Drawing and									
				Specifications									
	Appearance of OFAC		lot										
4.1.1		Naked Eye			Smooth	FAT Report	Α	J	U	z	N	Υ	
						FAT Report							
			10%of										
				BSPTCL Approved Drawing and									
				Specifications									
			lot		1200 mmx600								
4.1.2	Dimensions	Measurement			mmx800 mm or equivalent		Α	J	U	z	N	Υ	
						FAT Report							
			10%of										
				BSPTCL Approved									
				Drawing and Specifications									
			lot										
4.1.3	Material of Drum	Measurement			Wooden Drum		Α	J	U	z	N	Υ	
						FAT Report							
			100%of										
				BSPTCL Approved									
				Drawing and Specifications									
	Caaling aabla anda		lot										
4.1.4	Sealing cable ends with ends caps.	Naked Eye			Proper sealing at the cable ends		Α	J	U	z	N	Υ	
						FAT Report							
			100%of										
				BSPTCL Approved									
	Signing by the			Drawing and Specifications									
	inspection official on		lot										
4.1.5	the drum details printed on paper.	Naked Eye					А	J	U	z	N	Υ	
	, page page 1	,-				FAT Report				1			
			100%of										
				BSPTCL Approved									



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			Customer :				Rev No: 00				Valid Up to:	Till Revision	
			BSPTCL										
			BSPICE										
	<del>-</del>												
	Sealing/pasting the			Drawing and									
				Specifications									
	drum details over the		lot										
	ends cap with												
4.1.6	transparent tape.	Naked Eye					Α	J	U	Z	N	Υ	



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	Section E												
					5.1 Packing & Dispatch .								
				BSPTCL Approved		Α	J	s	W	N	N		
			100% of	Drawing and	BOQ								
5.1.1	Total Drums	Naked Eye	reals/shipment	Specifications									
3.1.1	Total Diulis	Nakeu Lye		DSDTCI Approved	Stenciling on drums	A	-	s	w	N	N		
			100% of	Drawing and	Otenoming on drams	r	ľ	ľ	**	ľ			
			reals/shipment	Specifications									
5.1.2	Shipping Mark	Naked Eye											
			100% of	BSPTCL Approved Drawing and	Polythene sheet covered to OF cable	A	l	S	w	N	N		
	Weather proof		reals/shipment	Specifications									
5.1.3	covering	Naked Eye											
				BSPTCL Approved		Α	J	s	w	N	N		
			100% of reals/shipment	Drawing and Specifications									
5.1.4	Drum number	Naked Eye	reals/simplificati										
				As per Dispatch	Stenciling on drums	Α	J	s	w	N	N		
	Consignee's name		100% of	Clearance / Instructions									
5.1.5	&address	Naked Eye	reals/shipment	ilistructions									
				As per Dispatch	Stenciling on drums	А	J	s	w	N	N		
			100% of	Clearance /									
5.1.6	Contractor's name & address	Naked Eye	reals/shipment	Instructions									
				As per Dispatch	24 F Approach cable	A	J	s	w	N	N		
			100% of	Clearance /									
5.1.7	Type of Cable	Naked Eye	reals/shipment	Instructions									
3.1.7	Type of Cable	Nakeu Lye		As per Dispatch		A	J	s	w	N	N		
			100% of	Clearance /	L.	r	ľ	ľ	"	l'	ľ		
l			reals/shipment	Instructions	24								
5.1.8	No. of fibers	Naked Eye				_							
	Year of		100% of		Stenciling on drums	A	ľ	s	w	N	N		
	manufacturing,		reals/shipment										
5.1.9	month & batch no.	Naked Eye	,	BSPTCL Approved Drawing and									
				Specifications	EM name	A	J	S	w	N	N		
	Name of the		100% of reals/shipment										
5.1.10	manufacturer	Naked Eye	- cara/ampment										
				As per Approved	As peer approved	A	J	s	w	N	N		
			100% of	BOQ	BOQ								
5.1.11	Total Cable Length	Naked Eve	reals/shipment	1							I		