## NTPC LTD CPG-1/VDC Raipur

# Qualifying Requirement (QR) for Vendor Enlistment for Supply of LT Power/Control Trailing Cables

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A)	MEG DET		OANTO OG
	2	MEG No MEG DESCRIPTION	81MEG-06 LT Power/Control Trailing Cables
	3	MEG RESPONSEBILITY	VDC
	4	ENLISTMENT	Category-1
		CATEGORY	Jacobsky 1
B)	Technica	al Criteria of QR:	
		B:	(T. 11) O. 11
	a)	Bidder should be a manufact	urer of Trailing Cables
	b)		st one (1) km of copper conductor, Elastomer (EPR) KV or higher grade in single/multiple orders during last five ation.
C)	Docume	nts required in support of me	eting QR :
	ce sta ma	rtificate / Certificate of registra atutory document as a proof of be	SSI / MSME registration certificate / BIS license / ISO tion from the concerned excise department / any other eing manufacturer of the LT Trailing cables. Brief details of rrd published catalogue for LT Trailing cables also to be
		e PO in support of award and co ecution of the supply of LT Traili	mpletion certificate/copies of invoice to establish successful ing cables as per QR.
D)	Docume	nts to be submitted to find ex	ecuted value of orders:
			support of meeting technical requirements as stated above, submitted by the Applicants applying for enlistment: -
	below) Comple	during previous five (5) years from the concern against the POs to be submitted	values of similar work (see definition at point E:Note- 1 om the date of application. Copy of Invoice / ned buyer/s in support of successful execution of l. These will be required for calculation of execution
	financial financial	year's reckoned from the date of	it & Loss statement for the previous three (3) completed of application. In case where the audited results for the last ration are not available, the financial result certified by a considered acceptable.
	1		attorney, Letter of undertaking, works information etc. as es of website <a href="https://www.vendor.ntpc.co.in">www.vendor.ntpc.co.in</a>
	4. NTPC	can request for other document	ts as necessary during the course of evaluation.
E)	NOTE-1	Similar works means: "Supply	of LT/HT Trailing cable.
	NOTE-2	against thereference PO (also application). Where PO value is	sic value of quantity of similar works executed/supplied applicable to partly executed POs as on date of s composite (i.e. including Taxes etc.), the applicant to apposite PO value mentioning Basic Value, Taxes etc.

CLAUSE NO.	1	rechnical requirements	ਜ਼ੀ C							
1.01.00		s and codes of practice referred to herein shall be the latest able official amendments and revisions as on date of opening of								
	bid. In case of conflict bety	ween this specification and those (IS: codes, standards, etc.) er shall prevail. All the cables shall conform to the requirements								
	IS 9968 (Pt 1): 1988.	Elastomer insulated cables for working voltages up to and including $1100\ V$								
	IS 14494: 2019	Elastomer Insulated Flexible Cables for use in mines								
	IS 8130 (1984)	Conductors for insulated electric cables and flexible cords [ETD 9: Power Cables]								
	IS 6380 : 1984	Specification for elastomeric insulation and sheath of electric cables (First Revision)								
	IS 14494: 2019	Elastomer Insulated Flexible Cables for use in mines								
	IS 9968 (Pt 2): 2002	Elastomer insulated cables for working voltages from 3.3. kV up to and including 33kV								
	IS : 3961	Recommended current ratings for cables								
	IS: 8130	Conductors for insulated electrical cables and flexible cords.								
	IS: 10418	Specification for drums for electric cables.								
	IS: 10810	Methods of tests for cables.								
	ASTM-D -2843	Standard test method for density of smoke from the burning or decomposition of plastics.								
	ASTMD 2863	method to determine the minimum concentration of oxygen in an oxygen/nitrogen mixture that will support a flaming burn in a plastic specimen.								
	IEC-754 (Part-I)	Tests on gases evolved during combustion of electric cables.								
	IEC-332-1 &3	Tests on electric cables under fire conditions. Part-3: Tests on bunched wires or cables (Category-B).								
2.00.00	TECHNICAL REQUIREME	INTS								
2.01.00	The Supplied cable sh drum.	ould be suitable for using with control cable reeling								
2.02.00	elastomeric compound by withstanding 90 deg.C cor	nned copper (class 5) conductor, insulated with heat resistant based on Ethylene Propyline Rubber (EPR) suitable for attinuous conductor temperature and 250deg C during short in heat resistant elastomeric compound, nylon cord reinforced,								
	,	TECHNICAL SPECIFICATION PAGE								
	н	T/LT/CONTROL TRAILING CABLES 1 OF 4								

CLAUSE NO.	TECHNICAL REQUIREMENTS
	outer-sheathed with heat resistant, oil resistant and flame retardant heavy duty elastomeric compound conforming to IS 9968.
2.03.00	Conductor of HT/LT/Control cables shall be made of tinned copper.
2.04.00	In addition to meeting all the requirements of Indian Standards referred to, outer sheath of all the cables shall have the following FRLS properties.
	(a.) Oxygen index of min. 29. (As per IS 10810 Part-58/ASTM-D-2863)
	(b.) Acid gas emission of max. 20% (As per IEC-60754-I)
	(c.) Smoke density rating shall not be more than 60% during Smoke Density Test as per ASTMD-2843.
	(d) Flammability test on finished cable as per IEC: 60332-part 3 cat B
2.05.00	In addition to manufacturer's identification on cables as per IS, following marking shall also be provided over outer sheath:
	(a.) Cable size and voltage grade - To be embossed
	(b.) Word 'FRLS' at every 5 meter - To be embossed
	(c.) Sequential marking of length of the cable in meters at every one meter - To be embossed / printed.
	(d) Manufacturer Name/Trade Name as well HR-90
	The embossing / printing shall be progressive, automatic, in line and marking shall be legible and indelible. For EPR cables identification shall be printed on outer sheath.
2.06.00	All cables shall meet the fire resistance requirement as per Category-B of IEC-332 Part-3.
2.07.00	Allowable tolerances on the overall diameter of the cables shall be +\-2 mm maximum over the declared value in the technical data sheets.
2.08.00	In plant repairs to the cables shall not be accepted. Pimples, fisheye, blow holes etc. are not acceptable.
2.09.00	Cable selection & sizing
	Control cables shall be sized based on the following considerations:  (a) The minimum conductor cross-section shall be 1.5 sq.mm.
	(b) The minimum number of spare cores in control cables shall be as follows:
	No. of cores in cable Min. No. of spare cores
	2C, 3C NIL
	5C 1
	7C-12C 2
	14C & above 3
2.10.00	Cable lengths shall be considered in such a way that straight through cable joints are avoided.
2.11.00	Cable shall be suitable for reeling and unreeling duty.
	TECHNICAL SPECIFICATION PAGE HT/LT/CONTROL TRAILING CABLES 2 OF 4

CLAUSE NO.	TECHNICAL REQUIREMENTS	<b>A</b>
3.00.00	CONSTRUCTIONAL FEATURES	
3.01.00	6.6/3.3/1.1 KV grade Trailing cables shall have tinned copper (class 5)conductor, insulated with heat resistant elastomeric compound based on Ethylene Propylene Rubber(EPR) suitable for withstanding 90 deg.C continuous conductor temperature and 250deg C during short circuit, inner-sheathed with heat resistant elastomeric compound, nylon cord reinforced, outer-sheathed with heat resistant, oil resistant and flame retardant heavy duty elastomeric compound conforming to IS 9968.	
4.00.00	CABLE DRUMS	
	(a.) Cables shall be supplied in non-returnable steel drums of heavy construction. The drum shall be designed on the basis of weight, diameter, bending radius and length of cable. The surface of the drum and the outer most cable layer shall be covered with waterproof cover. Both the ends of the cables shall be properly sealed with heat shrinkable PVC/ rubber caps secured by 'U' nails so as to eliminate ingress of water during transportation, storage and erection.	
	(b.) Each drum shall carry manufacturer's name, purchaser's name, address and contract number, item number and type, size and length of cable and net gross weight stenciled on both the sides of the drum. A tag containing same information shall be attached to the leading end of the cable. An arrow and suitable accompanying wording shall be marked on one end of the reel indicating the direction in which it should be rolled.	
	(c.) The standard drum length for control cables with a maximum tolerance of +/- 5% may be decided by the bidder subject to condition that there shall not be any joint in cable, where application length of cable is up to & including 1000 meter. One drum length of each cable size can be of non-standard length (not less than 250 meter) so as to match the ordered quantity Subject to condition that there shall not be any joint in cable	
5.00.00	TESTS	
	1.0 All equipment's to be supplied shall be of type tested design. During detailed engineering, the contractor shall submit for Owner's approval the reports of all the type tests as listed in this specification and carried out within last ten years from the date of bid opening. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.	
	2.0 However if the contractor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct all such tests under this contract at no additional cost to the owner either at third party lab or in presence of client /owners representative and submit the reports for approval.	
	3.0 All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.	
	4.0 The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and "No design Change". Minor changes if any shall be highlighted on the endorsement sheet.	
	TECHNICAL SPECIFICATION PAGE HT/LT/CONTROL TRAILING CABLES 3 OF 4	

CLAUSE NO.		TECHNICAL REQUIREN	/ENTS (대리네뷔)						
5.01.00	TYPE TESTS	3							
5.01.01			ests shall be submitted for one size of he employer during detailed engineering.						
	S. No.	Type Test	Remarks						
		For Conductor							
	1.	Resistance test							
		For Armour Wires / Formed Wires (	If applicable)						
	2.	Measurement of Dimensions							
	3.	Tensile Test							
	4.	Elongation test							
	5.	Torsion test	For round wire only						
	6.	Wrapping test	For aluminium wires / formed wires only.						
	7.	Resistance test							
	8(a).	Mass of zinc Coating test	For GS wires/formed wires only						
	8(b).	Uniformity of zinc coating	For GS wires/formed wires only						
	9.	Adhesion test	For GS wires/formed wires only						
		For PVC insulation & PVC Sheath							
	10.	Test for thickness							
	11.	Tensile strength and elongation test	before ageing and after ageing						
	12.	Ageing in air oven							
	13.	Loss of mass test	For PVC insulation and sheath only						
	14.	Hot deformation test	For PVC insulation and sheath only						
	15.	Heat shock test	For PVC insulation and sheath only						
	16.	Shrinkage test							
	17.	Thermal stability test	For PVC insulation and sheath only						
		TECHNICAL SPECIFICATION HT/LT/CONTROL TRAILING CAR							

CLAUSE NO.	TECHNICAL REQUIREMENTS											
	S. No.		Type Test		Remarks							
	18.	Oxygen i	ndex test	F	or outer sheath only							
	19.	Smoke d	ensity test	F	or outer sheath only							
	20.	Acid gas	generation test	F	or outer sheath only							
		For com	oleted cables									
	21.	Insulatio	Insulation resistance test(Volume resistivity method)									
	22.	High volt	High voltage test									
	23.	Flammak	egory-B)									
	S. No.		Type Test	Remarks								
		For Cor	nductor									
	1.	Resista	nce test									
	2.	Tensile	Test									
	3.	Wrappi	ng test									
	4.	Elongat	ion test									
	5.	Torsion	test	F								
	6.											
	7.											
	8(a).	Mass o	f zinc Coating test	F	or GS wires/formed wires on	ly						
	8(b).	Uniforn	nity of zinc coating	F	or GS wires/formed wires on	ly						
	9.	Adhesid	on test	F	or GS wires/formed wires on	ly						
		For PV	Cinsulation & PVC Sheath									
	10.	Test for	thickness									
	11.	Tensile test	strength and elongation	b	efore ageing and after agein	g						
	12.	Ageing	in air oven									
	L											
			TECHNICAL SPECIFICATION HT/LT/CONTROL TRAILING CABLE	ES		PAGE 5 OF 4						

CLAUSE NO.		TECHNICAL REQU	REMENTS एनरीपीमी NTPC								
	S. No.	Type Test	Remarks								
	13.	Loss of mass test	For PVC insulation and sheath only								
	14.	Hot deformation test	For PVC insulation and sheath only								
	15.	Heat shock test	For PVC insulation and sheath only								
	16.	Shrinkage test									
	17.	Thermal stability test	For PVC insulation and sheath only								
	18.	Oxygen index test	For outer sheath only								
	19.	Smoke density test	For outer sheath only								
	20.	Acid gas generation test	For outer sheath only								
		For completed cables									
	21.	Insulation resistance test (Volu	me resistivity method)								
	22.	High voltage test									
	23.	Flammability test as per IEC-33	2 Part-3 (Category-B)								
5.02.00	Insulation High volta Flammabil Indicative lis	lity test as per IEC-332 Part-3 (Ca	ategory-B) ceptance tests shall be as per Quality Assurance								
		TECHNICAL SPECIFICA HT/LT/CONTROL TRAILIN									

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	33.2		STATE OF	1	
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ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE

TRAILING CABLE (POWER / CONTROL) LT & HT ( UPTO 6.6 KV) FRLS

#### STANDARD QUALITY PALN

QP NO.: 0000-999-QOE-S- 046

REV. NO: 00 PAGE | OF 6

S H Malani

REVIEWED BY

Rajeev Garg PK Basu

APPROVED BY

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SI.No	Component & Operation	Characteristics	Class	Type of Check	Quantum	of Check	Reference document	Acceptance Norms	Format of Re	cord	M	С	N	Remarks	
1	2	3	4	5		6	7	8	9	D*		10**		0 11	
	100			12	M	C/N				VII	W			The state of the s	STE.

CONFORMING TO CODE:

IS 9968- PART I,II AND NTPC

TECHNICAL SPECIFICATIONS

#### A RAW MATERIAL

		a) Make	Major	Verification			Refer Note 1	Refer Note 1		Р	-	-	
		b) Grade	Major	Physical	One sample	One sample per	NTPC ADS	NTPC ADS		Р	V	V	1
		c) Surface Finish	Major	Physical	per lot	lot	IS: 613	IS: 613		Р	22	-	
1	Copper Rod	d) Dimensions	Major	Physical			MFRR'S STD	MFRR'S STD	IR / Mfrr's TC	Р	**	-	
.5	оорры нов	e) Tensile Strength, Elongation, Bend Test, Hardness .	Major	Physical	One sample per heat	One sample per heat	IS: 613 / IS: 1599	IS: 613 / IS: 1599		Р	٧	V	
	_	f) Resistivity /Conductivity	Major	Electrical	One sample per lot	One sample per lot	NTPC ADS / IS 613	NTPC ADS / IS 613	30	Р	V	V	
2	Tin Ingot	Tin purity	Мајог	Chemical	One sample per lot		Mfrr's Std / IS 26	IS 26	Mfrr's TC / Lab TC	V	**	-	
		a)Material	Major	Physical	_		NTPC ADS	NTPC ADS		Р	-	1.000	
3	Tape / Braiding (As applicable)	b)Thickness	Major	Measurement	One sample of each type per lot		MFRR'S STD / IS 9968	MFRR'S STD / IS 9968	IR	Р		-	
		c)Width	Major	Measurement			MFRR'S STD	MFRR'S STD		Р		//255	
		a) Make,	Major	Visual			Refer Note 1	Refer Note 1		Р			
		b) Grade, Colour,	Major	Verification			NTPC Specs /ADS	NTPC Specs /ADS		V			
		c) Shelf Life of ingredients	Major	Verification	1		MFR STD	MFR STD		V			
4	Elastomeric Compound (EPR) for Insulation, FRLS Inner Sheath & FRLS Outer Sheath	b) Insulation charcterstics check by Rheography / Spectrum Analysis	Major	Measurement	One sample per lot	(#U	MFRR STD	MFRR STD	IR / Mfrr's TC	Р	-	-	o
		c) TensileStrength, Elongation of Cured Samples	Major	Physical		=	IS 6380	IS 6380		Р	-	(49)	
		d) Volume Resistivity	Major	Measurement			10 0000	10 0000		Р	25	-	
	1	e) Hot Set Test	Major	Measurement				_		P	44	-	

LEGEND: \* RECORDS, INDENTIFIED WITH "TICK" ( √ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

<sup>\*\*</sup> M: MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS "W".

IS 9968 wherever indicated shall be read as IS 9968 Part I (1988) for LT (upto 1.1 kV) Cable and as IS 9968 Part 2 (2002) for HT Cable (upto 6.6 kV)

	एनवीपीसी NTPC	ITEM (MATERIAL, CLASS, GF ETC.): TRAILING CABLE (POWER LT & HT ( UPTO 6.6 KV) FR	/ CONTROL	The section of the se	CONFORMING TO CODE: IS 9968- PART I,II AND NTPC			QP NO.: 0000-999-Q REV. NO: 00 PAGE 2-OF 6	OE-S- 046		SHM	alani Garg	Te	APPROVED BY	
		2, 3,11 (3, 12, 3, 3, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	).m.=		TECHNICAL	L SPECIF	ICATIONS				10.1000.000	de	My	(AK GARG)	
.No	Component & Operation	Characteristics	Class	Type of Check	Quantum	of Check	Reference document	Acceptance Norms	Format of Red	cord	M	С	N	Remark	
1	2	3	4	5	6		7	8	9	D*		10**		11	
		f) Oxygen Index, Temp.Index,Smoke Density, Acid Gas Generation	Major	Measurement	One sample per lot	C/N	NTPC ADS / IS 10810	NTPC ADS	IR		Р				
-		a) Make,	Major	Visual			Refer Note 1	Refer Note 1			Р		100		
5	Semiconducting Compound (Applicable	b) Elect. Test	Major	Measurement	One sample per lot		IS 9968	IS 9968	IR / Mfrr's TC		Р		-		
	for HT Cable only)	c) Shelf Life of ingredients	Major	Verification			MFR STD	MFR STD			V	92			
5	Wooden Drums	a) Dimension & Surface Finish	Major	Visual	100%	100%	IS 10418/ Mfrr's Std	IS 10418/ Mfrr's Std (free from sharp edges)	IR / Mfrr's TC		Р	v	v		
		b)Anti-termite treatment	Major	Visual	100%	100%	IS 10418	IS 10418			V	V		CoC from dru MFRR.	
7	Steel Drums	a) Dimension	Major	Visual	100%	100%	MFRR's Std	MFRR's Std	IR / Mfrr's TC						
r.,	Steel Drums	b)Surface Finish	Major	Visual	100%	100%	MFRR's Std	Smooth & without any sharp edges	IR / Mfrr's TC		Р	V	V		
	IN PROCESS INSPECTIO	<u>N</u>													
		a) Surface Finish after Drawing ,Tinning	Major	Physical	One sample per setting	12.7	MFRR STD	Smooth Surface , No burrs / sharp edges							
	rinning or copper	b) Diameter of Strands	Major	Measurement			NTPC ADS / IS:8130	NTPC ADS / IS:8130	IR		Р	**			
	Strands	c) Elongation	Major	Physical	One sample		IS:8130	IS:8130	4 -						
		d) Persulphate test	Major	Chemical	per lot		IS:8130	IS:8130						(B.1.d -Only	

NTPC ADS /IS:8130 NTPC ADS /IS:8130

Major

e) Resistivity / Conductivity

Electrical

LEGEND: \* RECORDS, INDENTIFIED WITH \*TICK\* ( \ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

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IS 9968 wherever indicated shall be read as IS 9968 Part I(1988) for LT (upto 1.1 kV) Cable and as IS 9968 Part 2 (2002) for HT Cable (upto 6.6 kV)

ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.):

TRAILING CABLE (POWER / CONTROL) IT & HT ( LIPTO 6 6 KM ERIS

### STANDARD QUALITY PALN

CONFORMING TO CODE:

IS 9968- PART I,II AND NTPC

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REVIEWED BY APPROVED BY

S H Malani

Rajeev Garg

		LT & HT ( UPTO 6.6 KV) FRI	LS		TECHNICAL						PK Ba	Su (	COSC	(AK GARG)
SI.No	Component & Operation	Characteristics	Class	Type of Check	Quantum	of Check	Reference document	Acceptance Norms	Format of Re	cord	M	C	N	Remarks
1	2	3	4	5	6		7	8	9	D*		10**		11
					M	C/N						-		The Control
		a) Diameter & No. of wires	Major	Physical			NTPC ADS	NTPC ADS						
	Conductor : Bunching /	b) Lay direction& Lay length	Major	Count	One sample		MFRR STD	MFRR STD						
	Rope-Cord Stranding and Taping	c) Area of Bunched conductor	Major	Measurement	per setting	10	NTPC ADS	NTPC ADS	IR		P	V	V	
	and raping	e) Tap Overlap percentage	Major	Visual			MFRR STD	MFRR STD						
		d) Resistance	Critical	Electrical			NTPC ADS	NTPC ADS						
		a)Thickness	Major	Measurement	100%		IS 9968	NTPC ADS / IS:9968						
		b) Surface finish	Major	Visual	During m/c. setting		IS 9968 / MFRR'S STD	Smooth & free from defects.			Р		333	
3	Insulation	d) Spark Test (not applicable for screened cores)	Critical	Electrical	100%	-	IS 9968	IS 9968	IR					
		c)Tensile Strength & Elongation and Hot Set Test	Major	Physical	Each setting / Min 2 samples in running production		IS 9968	IS: 6380			Р	v	V	
	Semiconducting Screen	a) Thickness ,Material	Major	Physical	once in a		MFRR'S STD	MFRR'S STD						
4	on Conductor &	b) Surface finish (over semi - conducting insulation screen)	Major	Visual	At every setting	¥	MFRR'S STD	Smooth & free from defects.	IR		Р	-	100	
	CULTY / Extended Control of the Cont	c) HV Test on screened core	Critical	Electrical	100%		IS 9968	IS 9968						
		a) No & Diameter of braid wires	Major	Count & Measurement	2 times in a shift		IS 9968	IS 9968						
5	Screening Tape & Braiding (wherever applicable)	b) Surface finish	Minor	Visual	1 sample per lot		IS 9968 / MFRR'S STD	Smooth finish; Protruding ends etc.	IR		Р			
		c) Coverage density / filling factor	Major	Physical	At the time of setting		IS 9968	IS 9968						

LEGEND: \* RECORDS, INDENTIFIED WITH "TICK" (V ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

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(	एनरीपीसी NTPC	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.): TRAILING CABLE (POWER / CONTROL) LT & HT ( UPTO 6.6 KV) FRLS			STANDARD QUALITY FALIN			QP NO.: 0000-999-QOE-S- 046 REV. NO: 00 PAGE 4 OF 6			S H Malani Rajeev Gard PK Basu			APPROVED BY
I.No	Component & Operation	Characteristics Class		Type of Check	Quantum of Check		Reference document	Acceptance Norms	Format of Record		M	C	N	(AK GARG) Remarks
1	2	3	4	5	6		7	8	9	D*		10**	-	11
				42	M	C/N					0	0.00F		No Oak
	Laying up of Cores(Pair Formation)	a) Sequence of laying	Major	Visual	At the time of setting & at Standard length	-	NTPC ADS / MFRR'S STD	NTPC ADS / MFRR'S STD	IR					-
		b) Core identification	Major	Visual			NTPC ADS /IS 9968	NTPC ADS /IS 9968			р			
6		c)Lay Length and Lay direction	Major	Visual			IS 9968	IS 9968				373		
		d)Shape of laid up Assly	Major	Visual			IS 9968	NTPC ADS / IS 9968 / MFRR'S STD						
	Inner & Outer Sheath	a) Thickness ,Colour	Major	Physical	Sample at the start of the process & at Standard length		NTPC ADS / IS 9968	NTPC ADS / IS 9968	IR					
		b) Overall diameter	Major	Physical			NTPC ADS / IS 9968	NTPC ADS / IS 9968			Р		u l	
7		c) Surface finish	Minor	Visual		20	IS 9968 / MFRR'S STD	Smooth & free from defects.						
		d) Tensile Strength & Elongation before & after aging & Hot-set test	Major	Physical			IS 9968	IS 9968			Р	V	٧	
		a) Time of curing	Major	Physical			MFRR'S STD	MFRR'S STD						
8	Vulcanization / Curing	b) Temperature	Major	Physical	Each		MFRR'S STD	MFRR'S STD	IR	×	Р	V	V	
NTO.	3	c) Surface finish & Identification printing	Major	Physical	Length		NTPC ADS / IS 9968	NTPC ADS	313		1.			

TYPE TEST: Type test clearance from NTPC site as per tender /PO tech specs shall be verified before final inspection.

#### FINAL INSPECTION OF FINISHED CABLE

	1.Conductor Resistance	Critical	Electrical	100%	100%	IS 9968	NTPC ADS / IS 9968	TC	٧	Р	W	W	
a) Routine Tests	2. High Voltage	Critical	Electrical	100%	100%	IS 9968	NTPC ADS / . IS 9968	TC	٧	Р	W	W	
	3. Partial Discharge	Critical	Electrical	100%	100%	IS 9968	NTPC ADS / IS 9968	TC	٧	Р	W	W	for 3.3 kV & above

CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.

IS 9968 wherever indicated shall be read as IS 9968 Part I(1988) for LT (upto 1.1 kV) Cable and as IS 9968 Part 2 (2002) for HT Cable (upto 6.6 kV)



ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.):

TRAILING CABLE (POWER / CONTROL) LT & HT ( UPTO 6.6 KV) FRLS

STANDARD QUALITY PALN

IS 9968- PART I.II AND NTPC

QP NO.: 0000-999-QOE-S- 046

**REV. NO: 00** PAGE5 OF 6 S H Malani Rajeev Garg

REVIEWED BY

PK Basu

APPROVED BY

(AK GARG) SI.No Component & Operation Characteristics Class Type of Check Quantum of Check Reference document | Acceptance Norms Format of Record M C Remarks 10\*\* 4 5 D\* 110000 M C/N 1 Dimensions (Overall

CONFORMING TO CODE:

**TECHNICAL SPECIFICATIONS** 

b) Acceptance Te

	dia, Thickness of Insulation, Inner sheath, Outer sheath, Tape, Braiding ,Conductor dia & strands), Colur of sheaths, Identification of cores	Major	Measurement / Physical	IS 9968		IS 9968	NTPC ADS / IS 9968	тс	V	Р	W	W	
	2. Conductor Resistance	Major	Electrical	IS 9968		IS 9968	NTPC ADS / IS 9968	TC	V	Р	W	W	
	Tensile Strength &     Elongation on insulation &     Sheath before aging	Major	Physical	IS 9968	Same as	IS 9968	NTPC ADS / IS 9968	тс	٧	Р	w	W	
	Hot set test for insulation & sheath	Major	Physical	IS 9968	Col 6	IS 9968	NTPC ADS / IS 9968	TC	٧	Р	W	W	
Tests	5. Insulation Resistance (Volume Resistivity) on insulation	Critical	Electrical	IS 9968		IS 9968	NTPC ADS / IS 9968	тс	٧	Р	w	W	
	6. High Voltage Test	Critical	Electrical	IS 9968		IS 9968	NTPC ADS / IS 9968	тс	V	Р	w	W	Refer Note 4
	7. Partial Discharge Test (for cable of rating 3.3 kV & above only )	Critical	Electrical	IS 9968		IS 9968	NTPC ADS / IS 9968	тс	٧	Р	W	W	Refer Note 4
	Electrical test on     Semiconducting non-metallic     screen	Major	Electrical	IS 9968		IS 9968	NTPC ADS / IS 9968	тс	٧	Р	W	W	
	9. Length,Surface Finish , Printing,Sequential Marking,	Major	Physical	100%	One length of each size randomly selected from the	IS 9968	NTPC ADS / IS 9968	тс	٧	Р	W	W	Legible & indelible printing / marking

offered lot LEGEND: \* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

P: PERFORM W: WITNESS AND V: VERIFICATION, AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS "W".

IS 9968 wherever indicated shall be read as IS 9968 Part I(1988) for LT (upto 1.1 kV) Cable and as IS 9968 Part 2 (2002) for HT Cable (upto 6.6 kV)

	एनरीपीसी NTPC	ITEM (MATERIAL, CLASS, G ETC.): TRAILING CABLE (POWER LT & HT ( UPTO 6.6 KV) F	STANDARD QUALITY PALN CONFORMING TO CODE: IS 9968- PART I,II AND NTPC TECHNICAL SPECIFICATIONS			QP NO.: 0000-999-QOE-S- 046 REV. NO: 00 PAGE OF 6				ved by alani Garg	eliz	APPROVED BY		
.No	Component & Operation	Characteristics	Class	Type of Check	Quantum of Check		Reference document	Acceptance Norms	Format of Record		M	C	N	Remarks
1	2	3	4	5	6		7	8	9	D*		10**		11
				10-41	M	C/N					-			6. 114
		10. TS & Elongation after aging in Air Bomb	Critical	Physical	IS 9968	One randomly selected Sample from the offered lot irrespective of the sizes		NTPC ADS / IS 9968	TC	٧	Р	W	W	
		Oxygen / Temperature Index		Physical	ASTM D-	2863         One           IEC 754-1         Sample           ASTM D-         from the	ASTM D-2863 / IS 10810	NTPC ADS	TC V					
		Acid Gas Generation					IEC 754-1 / IS	NTPC ADS				w		1
	c) FRLS Tests	3. Smoke density	Critical		ASTM D- 2843		ASTM D-2843 / IS 10810	NTPC ADS		٧	Р		W	
		4. Flammability Test					IEC 332 Pt3 Cat B	NTPC ADS						
	Packing & Marking	a) End sealing	Major	Visual	100%		NTPC ADS /IS 9968 / MFRR'S STD	NTPC SPECS / MFRR STD	IR		Р	w	V	
0		b) Packing	Major	Visual	100%		NTPC SPECS /ADS /IS 9968	NTPC SPECS / ADS	IR		Р	W	V	Ref Note 2&3
		c) Stencilling & Marking	Major	Visual	100%		NTPC ADS /IS 9968 / MFRR'S STD	NTPC SPECS / MFRR STD	IR		Р	W	V	

- 1) Makes of Elastomeric Compound, semiconducting compound & copper shall be indicated in the QP submitted with the bid/application
- 2) The surface of the drum and the outer most cable layer shall be protected with water proof cover.
- 3) Both the ends of cables shall be properly sealed with heat shrinkable PVC/ rubber caps secured by "U" nails.
- 4) In case, HV /PD tests have been witnessed on a cable by NTPC during routine test, it shall not be repeated on the same cable during acceptance tests LEGEND: \* RECORDS, INDENTIFIED WITH "TICK" ( √ ) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
- M: MANUFACTURER / SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W'.
- IS 9968 wherever indicated shall be read as IS 9968 Part I(1988) for LT (upto 1.1 kV) Cable and as IS 9968 Part 2 (2002) for HT Cable (upto 6.6 kV
- 5) Reference and Acceptance norms shall be derived from following in the same sequence-
- i) NTPC Approved drawing / data sheet; ii) NTPC tech specs; iii) Purchase Order; iv) Relevant national standard
- v) Relevant International standard; vi) Manufacturer's standard vii) Good Engineering practices
- 6) Main Contractor Column may please be ignored.