

4X270 MW TSGENCO BHADRADRI TPS

**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLE
BHEL DOC. NO. PE-TS-411-507-E005**

REVISION 01



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
POWER PROJECT ENGINEERING INSTITUTE
NOIDA (U.P), INDIA**



TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLE

SPECIFICATION NO. PE-TS-411-507-E005

REVISION 01

DATE:

SHEET 1 OF 1

CONTENTS

Sl. No.	DESCRIPTION	NO. OF SHEETS
1.0	CONTENT SHEET	01
2.0	COMPLIANCE SHEET	01
3.0	SECTION – I	
	SPECIFIC TECHNICAL REQUIREMENT	03
	TECHNICAL DATA SHEET (DATA SHEET-A)	04
	GUARANTEED TECHNICAL PARTICULARS (DATA SHEET-C)	05
4.0	SECTION- II	
	STANDARD TECHNICAL REQUIREMENTS	02
	QUALITY PLAN	08
	ANNEXURE-A TO QAP	04

TOTAL SHEETS INCLUDING COVER SHEET = 29



TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLE

SPECIFICATION NO. PE-TS-411-507-E005

REVISION 01

DATE: 02.08.2017

SHEET 1 OF 1

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ-Cum-Price schedule' of the specification shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

BIDDER'S STAMP & SIGNATURE



**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLE**

SPECIFICATION NO. PE-TS-411-507-E005

VOLUME II

SECTION I

REVISION 01

DATE: 02.08.2017

SHEET 1 OF 3

SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLE

SPECIFICATION NO. PE-TS-411-507-E005

VOLUME II

SECTION I

REVISION 01

DATE: 02.08.2017

SHEET 2 OF 3

1.0 SCOPE OF ENQUIRY

- 1.1 Design, Manufacture, Inspection and Testing at Manufacturer's works, proper packing and delivery to site 4X270MW BHADRADRI TPS of LT XLPE FIRE SURVIVAL CABLES conforming to this specification.
- 1.2 General technical requirements of the LT XLPE FIRE SURVIVAL CABLES are indicated in Section-II. Project specific technical/ quality requirements / changes are listed in Section-I.
- 1.3 The stipulations of Section-I, followed by those of Data Sheet-A shall prevail in case of any conflict between the stipulations of Section-I, Data Sheet - A & Section-II.
- 1.4 It is not the intent to specify herein all the details of design & manufacture. However, the equipment shall conform in all respects to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation at site conditions.
- 1.5 The documents shall be in English Language and MKS system of units

2.0 BILL OF QUANTITIES:

- 2.1 Quantity requirements shall be as per 'BOQ-cum-price schedule' as part of NIT.

3.0 SPECIFIC TECHNICAL REQUIREMENTS

"NIL"

4.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED

4.1. Documents required along with Technical offer:

Signed and Stamped copies of following documents:-

- a) Schedule of BOQ cum Price Schedule (Unpriced)
- b) Compliance certificate
- c) Schedule of deviations

4.2. Documents required after award of LOI

Following documents/drawings shall be submitted after placement of order for BHEL & customer's approval:-

SL NO	DOCUMENT TITLE	DWG. / DOCUMENT No.	Document Type	First Submission	Resubmission
1	Data Sheet for LT XLPE Fire Survival Cables	PE-V0-411-507-E181	Primary	Within 2 week of award of contract.	Within 1 week of comments
2	Cross-sectional Drawings for LT XLPE Fire Survival Cables	PE-V0-411-507-E183	Primary	Within 2 week of award of contract.	Within 1 week of comments
3	Quality Plan LT XLPE Fire Survival Cables	PE-V0-411-507-E920	Primary	Within 2 week of award of contract.	Within 1 week of comments



**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLE**

SPECIFICATION NO. PE-TS-411-507-E005

VOLUME II

SECTION I

REVISION 01

DATE: 02.08.2017

SHEET 3 OF 3

- 4.3. Standard Quality Plan as enclosed in the technical specification is to be appended with cover sheet bearing document number and description as stated above. The signed and stamped copy of the same shall be submitted to BHEL without making any changes in the contents of the document.
- 4.4. The successful bidder shall submit the standard list of raw material suppliers/ sub-vendors of each bidder for approval without any commercial implications. Changes to the same for specific projects, if proposed by any bidder, shall be to BHEL approval.



**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLES**

SPECIFICATION NO. PE-TS- 411-507-E005

VOLUME II

SECTION – I

REVISION 01

DATE: 02.08.2017

SHEET 1 OF 4

DATA SHEET - A



TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES

SPECIFICATION NO. PE-TS- 411-507-E005

VOLUME II

SECTION – I

REVISION 01

DATE: 02.08.2017

SHEET 2 OF 4

DATA SHEET-A

I. TECHNICAL DATA;

1.0	Type of Cable	LT XLPE Fire Survival Cable
2.0	Standard applicable in general	BS 7846, BS 6724, BS 7655, BS-EN-60228, ASTM D: 2843, ASTM D-2863, IEC-60754-1, IEC-60331 (PART-1), IEC-60332-3, SS-424-1475
3.0	Voltage Grade	1100V
4.0	Number of cores, cross sectional area of conductors and quantities	As per BOQ-Cum Price schedule.
5.0	CONDUCTOR	
(a)	Material	Untinned Annealed high conductivity Copper
	Grade and Class	Stranded Class 2
(b)	Standard Applicable	BS-EN-60228
(c)	Shape	Circular/Circular Compacted/ shaped
(d)	Min. number of strands	As per Table-2 of BS-EN-60228
6.0	FIRE BARRIER TAPE	Glass Mica tape in two layers with minimum 50% overlap, suitable to meet performance requirements as per Clause 12.0 below
7.0	INSULATION	
(a)	Material	(GP8) XLPE
(b)	Standard Applicable	BS 7655
(c)	Continuous withstand temperature	90°C
(d)	Short-circuit withstand temperature	250°C
(e)	Method of application	Pressure extruded (sleeve extrusion is not acceptable).
(f)	Method of curing	Dry/ Steam/ Gas/ Sioplas
(g)	Nominal Thickness of Insulation	As per BS-6724, BS-7864
7.0	CORE IDENTIFICATION	Color coding as per BS 6724
8.0	INNER SHEATH	
(a)	Material	Polymeric material
(b)	Grade & Type	Extruded, LTS1
(c)	Standard Applicable	BS-7655-6.1
(d)	Color	Black
(e)	Type	FRLSZH, suitable to meet performance reqmt. mentioned at clause 11.0 below
(f)	Fillers	Not Acceptable
(g)	Method of application	Pressure Extruded (sleeve extrusion is not acceptable)
9.0	ARMOUR	
(a)	Material:	For multi core cables: Single Layer of GS round wire (as per BS 6724, BS-7864). For single core cables: Single Layer Aluminium round



TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES

SPECIFICATION NO. PE-TS- 411-507-E005

VOLUME II

SECTION – I

REVISION 01

DATE: 02.08.2017

SHEET 3 OF 4

		wire as per BS 6724, BS-7864)
(b)	Gap between armour wires/ formed wires	Shall not exceed one armour round wire space (No cross-over/ over-riding).
(c)	Breaking load of joint	95 % of normal armour
10.0	OUTERSHEATH	
(a)	Material	Polymeric material
(b)	Grade & Type	Extruded, LTS1
(c)	Standard Applicable	BS 7655
(d)	Color	Black
(e)	Type	FRLSZH, suitable to meet performance reqmt. as defined at clause 11.0 below
(f)	Method of application	Pressure Extruded (sleeve extrusion is not acceptable)
	Marking	A. By Embossing @ 5m interval 1. Cable size (Nominal cross sectional area and no. of cores) and voltage grade. 2. Type of insulation/ sheath 3. Letters "FS", "BHEL-PEM" & "TSGENCO" 4. Manufacturer's Name/Trade Name 5. Year of manufacture B. By Embossing @ 1m interval:- Progressive sequential marking
11.0	FRLS CHARACTERISTICS FOR INNER/ OUTER SHEATH	
(a)	Oxygen index at room temperature of 50 deg C	Min 30 (As per ASTM D 2863)
(b)	Temperature index	Min. 350°C (As per ASTM D 2863)
(c)	Acid gas generation	Max. 2% (as per IEC-60754-1)
(d)	Smoke density rating	Max. 20% (as per ASTM D 2843)
(e)	Flammability Test	As per IEC: 60332-I on single cable, Swedish chimney test as per SEN-SS-424-1475-F3 & flammability test on multiple cables as per BS EN 50266, CAT-B
12.0	FIRE SURVIVAL TEST / FIRE RESISTANCE TEST	Meet the requirement of Circuit Integrity test for Min. 3HR. AT 750 DEG. C AS PER IEC 60331
13.0	TEST FOR RODENT & TERMITE TEST	Applicable as per manufacturer standard
14.0	TOLERANCE ON OUTER DIAMETER	+ 5%
15.0	STANDARD DRUM LENGTH	As specified in BOQ.
16.0	MINIMUM BENDING RADIUS	
(a)	Copper conductor cable	6XO.D.
(b)	Aluminium conductor cable	8XO.D.
17.0	CABLE DRUM	
(a)	Type of Drum	Wooden as per IS:10418/ Steel drum
(b)	Standard Drum Length	As specified in BOQ Cum price schedule



**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLES**

SPECIFICATION NO. PE-TS- 411-507-E005

VOLUME II

SECTION – I

REVISION 01

DATE: 02.08.2017

SHEET 4 OF 4

(c)	Painting	Entire surface to be painted
(d)	Outermost layer	To be covered with waterproof polyethylene

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES	SPECIFICATION NO. PE-TS- 411-507-E005	
		VOLUME II	
		SECTION I	
		REVISION 01	DATE: 02.08.2017
		SHEET 1 OF 5	

DATASHEET C

**GUARANTEED TECHNICAL PARTICULARS
(TO BE SUBMITTED BY SUCCESSFUL BIDDER)**

S.No.	Particulars	Unit	Description
1.0	GENERAL		
1.1	Name of Manufacturer	-	
1.2	Place of Manufacture	-	
2.0	STANDARDS APPLICABLE		
2.1	For general specification of XLPE FIRE SURVIVAL Cables	-	
2.2	For conductor material	-	
2.3	For material of inner-sheath & outer-sheath	-	
2.4	For method of tests	-	
2.5	For cable drums	-	
2.6	For oxygen index test	-	
2.7	For flammability test	-	
2.8	For acid gas generation test	-	
2.9	For smoke generation test	-	
2.10	For fire survival test	-	
2.11	Current rating of cables conforms to	-	
2.12	Short circuit rating conforms to	-	
3.0	INFORMATION TO BE FILLED IN FOR EACH SIZE CABLE IN THE FORM OF TABLE		
3.1	No. of cores x size	-	
3.2	Voltage grade (Uo/U)	kV	
3.3	Base current ratings as per standard		
a)	In air	Amp	
b)	In ground	Amp	
c)	ducts	Amp	
3.4	Short circuit rating	kA, sec	
3.5	CONDUCTOR		
a)	Applicable Standard	-	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES	SPECIFICATION NO. PE-TS- 411-507-E005	
		VOLUME II	
		SECTION I	
		REVISION 01	DATE: 02.08.2017
		SHEET 2 OF 5	

b)	Material type & grade	-	
c)	No & dia of wires in each core before stranding	no x mm	
d)	Shape	-	
e)	D.C. resistance of conductor at 20 deg. C	ohm/km	
f)	A.C. resistance of conductor at 90 deg. C	ohm/km	
g)	Reactance of cable at normal frequency	ohm/km	
h)	Electrostatic capacitance of cable at normal frequency	mF/km	
i)	Maximum conductor temperature	deg. C	
j)	Maximum short circuit temperature	deg. C	
3.6	HEAT BARRIER TAPE		
a)	Applicable Standard	-	
b)	Material	-	
c)	Thickness of tape	mm	
d)	No. of layers, overlap	-	
3.7	INSULATION		
a)	Applicable Standard	-	
b)	Material	-	
c)	Method of cross linking	-	
e)	Method of curing	-	
f)	Process of extrusion	-	
g)	Nominal thickness	mm	
h)	Minimum thickness	mm	
i)	Minimum insulation resistance constant at 27 deg. C	mega ohm/km	
j)	Minimum volume resistivity at 27 deg. C	ohm.cm	
k)	Minimum volume resistivity at 90 deg. C	ohm.cm	
l)	Dielectric strength of insulation		
m)	Resistivity of insulation		
n)	Acid gas generation of insulation & tape	%	
3.8	CORE IDENTIFICATION		
a)	Applicable Standard	-	
3.9	INNERSHEATH		

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES	SPECIFICATION NO. PE-TS- 411-507-E005	
		VOLUME II	
		SECTION I	
		REVISION 01	DATE: 02.08.2017
		SHEET 3 OF 5	

a)	Material & type	-	
b)	Nominal Thickness	mm.	
c)	Minimum Thickness	mm.	
d)	Process of Extrusion	-	
e)	Type & Shape of fillers (if used)	-	
f)	Colour	-	
3.10	ARMOUR		
a)	Applicable Standard	-	
b)	Material	-	
c)	Size/ dimensions	-	
d)	Minimum no. of wires/ formed wires	-	
e)	Maximum DC resistance of armour	-	
f)	Maximum AC resistance of armour	-	
g)	Minimum coverage	-	
3.11	OUTERSHEATH		
a)	Material & type	-	
b)	Nominal Thickness	mm.	
c)	Minimum Thickness	mm.	
d)	Process of Extrusion	-	
e)	Colour	-	
4.0	PERMISSIBLE VARIATION (PROJECT SPECIFIC)		
a)	Voltage variation	%	
b)	Frequency Variation	%	
c)	Combined voltage & frequency	IAbsl	
5.0	CHARACTERISTICS OF HOFR SHEATH (Inner & Outer)		
a)	Oxygen index at 50 deg. C.	-	
b)	Temperature index	-	
c)	Acid gas generation	-	
d)	Smoke density rating	-	
6.0	APPLICABLE TESTS UNDER FIRE CONDITIONS FOR SINGLE CABLE & MULTIPLE CABLES		

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES	SPECIFICATION NO. PE-TS- 411-507-E005	
		VOLUME II	
		SECTION I	
		REVISION 01	DATE: 02.08.2017
		SHEET 4 OF 5	

7.0	High Voltage Test Voltage	kV	
8.0	Water Absorption Test Voltage	kV	
9.0	CIRCUIT INTEGRITY TEST		
a)	Applicable Standard	-	
b)	Temperature	Deg. C.	
c)	Duration	hrs	
10.0	CABLE DRUMS		
a)	Type & construction	-	
b)	Standard drum length (as per BOQ)	-	
c)	Tolerance on drum length	(+/-) 5%	
11.0	DIAMETERS		
a)	Overall diameter of conductor	mm	
b)	Overall diameter over taped conductor	mm	
c)	Approximate cable diameter of insulated conductor	mm	
d)	Approximate Cable diameter over inner sheath		
e)	Approximate overall diameter of cable		
12.0	Tolerance on overall diameter	(±) mm	
13.0	Minimum bending radius	x O.D.	
14.0	Safe pulling force	kg.	
15.0	Maximum Charging current at nominal voltage (approx.)	amps/km	
16.0	Weight of cable / components	kg./m	
a)	Weight of conductor	-	
b)	Weight of fire barrier tape	-	
c)	Weight of insulation	-	
d)	Weight of polymeric material	-	
e)	Weight of Armour (GS/Aluminium)	-	
f)	Total weight of cable	-	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES	SPECIFICATION NO. PE-TS- 411-507-E005	
		VOLUME II	
		SECTION I	
		REVISION 01	DATE: 02.08.2017
		SHEET 5 OF 5	

17.0	Shipping Weight	kg	
18.0	Cable marking on outer sheath	-	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			



DOCUMENT TITLE

**TECHNICAL SPECIFICATION FOR LT
XLPE FIRE SURVIVAL CABLES**

SPECIFICATION NO. PE-TS-999-507-E006B

VOLUME II

SECTION II

REVISION 00

DATE: 13.07.2016

SHEET 1 OF 2

SECTION-II

STANDARD TECHNICAL SPECIFICATION



DOCUMENT TITLE

**TECHNICAL SPECIFICATION FOR LT
XLPE FIRE SURVIVAL CABLES**

SPECIFICATION NO. PE-TS-999-507-E006B

VOLUME II

SECTION II

REVISION 00

DATE: 13.07.2016

SHEET 2 OF 2

1.0 TECHNICAL REQUIREMENTS

- 1.1 Technical requirements for LT XLPE FIRE SURVIVAL CABLES shall be as indicated in this section, in addition to those specified in Section-I & Datasheet-A.

2.0 CODES & STANDARDS

- 2.1 The design, material, construction, manufacture, inspection, testing and performance of LT XLPE FIRE SURVIVAL CABLES shall conform to the latest revision of relevant standards and codes of practices mentioned in Data Sheet – A.
- 2.2 In case of conflict between the applicable reference standard and this specification, this specification shall govern.

3.0 QUALITY ASSURANCE REQUIREMENTS

- 3.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E006B as attached with the specification without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ultimate customer's approval. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage.
- 3.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved Quality Plan.
- 3.3 Type testing requirements, routine / acceptance testing and special testing requirements shall be as per Annexure to QAP. Charges for all these tests for all the equipment & components shall be deemed to be included in the bid price (except UV Radiation test).
- 3.4 The charges of UV Radiation test (if applicable) shall be reimbursed extra at actual against original money receipt of Govt. Lab. (CPRI/ ERDA etc).
- 3.5 Cost of cables consumed for testing shall be to bidder's account.

4.0 Packing

- 4.1 Cables shall be supplied in non-returnable drums. Material of cable drums shall be as specified in Datasheet-A.
- 4.2 In case of wooden drums, all wooden parts shall be manufactured from seasoned wood treated with copper naphthenates / zinc naphthenates (refer IS: 401). Dimensions of wooden drums shall be as per IS 10418. All ferrous parts shall be treated with suitable rust protective finish or coating to avoid rusting during transit and storage.
- 4.3 In case of Steel drums, New or practically new cable drums made of steel and painted with epoxy resin paint are to be used. Cable ends are carefully protected before packing. Over the cables polyethylene sheet shall be wrapped and then sealed properly. For Typical details of Steel drums, Annexure-I to Section-II, may be referred by the bidder. Bidder may modify, to choose appropriate dimensions of steel drums to suite various sizes/weight/ lengths of LT XLPE FIRE SURVIVAL CABLES.

5.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED

- 5.1 Documents/drawings to be submitted as part of technical offer & after placement of order for BHEL & customer's approval shall be as part of NIT.
- 5.2 All drawings/ documents indicated above shall be submitted through Document Management System (DMS).



**TECHNICAL SPECIFICATION FOR
LT XLPE FIRE SURVIVAL CABLE**

SPECIFICATION NO. PE-TS-411-507-E005

VOLUME II

SECTION II

REVISION 01

DATE: 02.08.2017

SHEET 1 OF 8

QUALITY PLAN

		STANDARD QUALITY PLAN		CUSTOMER :			PROJECT:			SPECIFICATION			
				BIDDER/ :			TITLE			NUMBER :			
		SHEET 1 OF 11		VENDOR			QUALITY PLAN			SPECIFICATION :			
		SYSTEM			NUMBER: PE-QP-999-507-E006B R0			TITLE					
SL. NO.	COMPONENT/ OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	SECTION AGENCY			VOLUME II	
									P	W	V	REMARKS	
1	2	3	4	5	6	7	8	9	10			11	
Instructions: 1. Cable manufacturer to maintain records to show co-relation of raw materials to finished cables i.e. raw material batch/ lot no. should be traceable to the final cable drum number or batch no. 2. Cable manufacturer to maintain all quality records identified as per all QP stages enumerated below whether it is identified for BHEL verification or witness or not.													
1.0	RAW MATERIALS & BOUGHT OUT ITEMS												
1.1	Aluminium/copper Rods (Conductor/ Armour Wire)	GENERAL : 1. Physical properties 2. Elec.Properties SPECIFIC CHECKS : a) Make b) Grade c) Resistivity	MA	Physical Tests	Sample/ Batch	BS-EN-60228 & Appd Datasheet	BS-EN-60228 & Appd Datasheet	Inpection Report/ Test Cert.	2/3	-	1/2		
			MA	Electrical Tests	Sample/ Batch	Relevant BS	Relevant BS	-do-	2/3	-	1/2		
			MA	Verify	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	2/3	-	1		
			MA	-do-	-do-	BS-EN-60228/ Approved datasheet	BS-EN-60228/ Approved datasheet	-do-	2/3	-	1		
			MA	Electrical Tests	Manufacturer std.	BS-EN-60228	BS-EN-60228	-do-	2/3	-	1		
1.2	GP8 (XLPE) Compound for insulation	GENERAL : 1. Physical properties 2. Elec.Properties SPECIFIC CHECKS : a) Make b) Type/ Grade c) Shelf life/ Storage condition	MA	Physical Tests	Sample/ Batch	BS -7655-1.3, BS-6724 & BS-7846 Mfs Std./ Approved datasheet	BS -7655-1.3, BS-6724 & BS-7846 Mfs Std./ Approved datasheet	Inpection Report/ Test Cert.	2/3	-	1/2		
			MA	Electrical Tests	Sample/ Batch	-do-	-do-	-do-	2/3	-	1/2		
			MA	Verify	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	2/3	-	1		
			MA	-do-	-do-	Approved datasheet	Approved datasheet	-do-	2/3	-	1		
			MA	-do-	-do-	Compound Manufacturer std.	Compound Manufacturer std.	-do-	2/3	-	1		
BHEL			PARTICULARS			BIDDER/VENDOR							
			NAME										
			SIGNATURE										
			DATE						BIDDER'S/VENDORS COMPANY SEAL				

		STANDARD QUALITY PLAN				CUSTOMER :			PROJECT:			SPECIFICATION			
						BIDDER/ :			TITLE			NUMBER :			
		SHEET 2 OF 11				VENDOR			QUALITY PLAN			SPECIFICATION :			
				SYSTEM			NUMBER: PE-QP-999-507-E006B R0			TITLE					
							ITEM : LT XLPE Fire survival Cables			SECTION			VOLUME II		
SL. NO.	COMPONENT/ OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS			
1	2	3	4	5	6	7	8	9	P	W	V	11			
1.3	Seathing Compound	GENERAL : 1. Physical properties 2. FRLS properties SPECIFIC CHECKS : 1. Make 2. Type/ Grade 3. Shelf life/ Storage condition	MA	Physical Tests	Sample/ Batch	BS -7655- 6.1 & Mfs Std./ Approved datasheet	BS -7655- 6.1& Mfs Std./ Approved datasheet	Inpection Report/ Test Cert.	2/3	-	1/2				
			MA	Envir/Chemical	Sample/ Batch	ASTMD:2843, ASTMD-2863, IEC-60754-1/ Approved datasheet	ASTMD:2843, ASTMD-2863, IEC-60754-1/ Approved datasheet	Inpection Report/ Test Cert.	2/3	-	1/2				
			MA	Verify	100%	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	2/3	-	1				
			MA	-do-	-do-	Approved datasheet	Approved datasheet	-do-	2/3	-	1				
			MA	-do-	-do-	Compound Manufacturer std.	Compound Manufacturer std.	-do-	2/3	-	1				
1.4	Glass Mica Tape	GENERAL : 1. Physical properties 2. Elec.Properties	MA	Physical Tests	Sample/ Batch	BS-EN-60228 & Mfr. Std./ Approved datasheet	BS-EN-60228 & Mfr. Std./ Approved datasheet	Inpection Report/ Test Cert.	2/3	-	1/2				
			MA	Electrical Tests	Sample/ Batch	-do-	-do-	-do-	2/3	-	1/2				
BHEL			PARTICULARS			BIDDER/VENDOR									
			NAME												
			SIGNATURE												
			DATE												
									BIDDER'S/VENDORS COMPANY SEAL						

		STANDARD QUALITY PLAN		CUSTOMER :			PROJECT: TITLE			SPECIFICATION NUMBER :		
				BIDDER/ VENDOR			QUALITY PLAN NUMBER: PE-QP-999-507-E006B R0			SPECIFICATION : TITLE		
				SYSTEM			ITEM : LT XLPE Fire survival Cables			SECTION VOLUME II		
SL. NO.	COMPONENT/ OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1	2	3	4	5	6	7	8	9	10			11
1.5	Galvanised steel round wire/Aluminium round wire	GENERAL : 1. Make 2. Dimension 3. Phy.and Elec. Properties 4.Galvanization Quality	MA	Verify	Manufacturer std.	Manufacturer approved source	Manufacturer approved source	Inpection Report/ Test Cert.	2/3	-	1	* Sample from each armour size/ Batch / Lot
			MA	Measurement	-do-	BS-6724, BS-7846 & Approved datasheet	BS-6724,BS-7846 & Approved datasheet	-do-	2/3	-	2	
			MA	Physical & Electrical Tests	Sample*	-do-	-do-	-do-	2/3	-	2	
			MA	Galv.Tests	-do-	Relevant. BS & Mfr. Std.	Relevant. BS & Mfr. Std.	-do-	2/3	-	2	
1.6	Wodden Drum	1. Phy. And constructional checks	MA	Meas.	Mfr's Plant Std.	IS10418	IS10418	Inpection Report/ Test Cert. coc	2/3	-	1	
		2. Anti termite treatment	MA	chemical	-do-	Mfr's Plant Std.	Mfr's Plant Std.		2/3		1	
1.7	Steel Drum	1. Dimension	MA	Meas.	Mfr's Plant Std.	Approved drawing of steel drum / BHEL specification	Approved drawing of steel drum / BHEL specification	Inpection Report/ Test Cert.	2/3	-	1	
		2. Surface finish	MA	Meas.	-do-	Surface shall be smooth	Surface shall be smooth	-do-	2/3		1	
BHEL			PARTICULARS			BIDDER/VENDOR						
			NAME									
			SIGNATURE									
			DATE									
									BIDDER'S/VENDORS COMPANY SEAL			

		STANDARD QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :		
				BIDDER/ VENDOR :			QUALITY PLAN NUMBER: PE-QP-999-507-E006B R0			SPECIFICATION : TITLE		
		SHEET 4 OF 11		SYSTEM			ITEM : LT XLPE Fire survival Cables			SECTION		VOLUME II
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1	2	3	4	5	6	7	8	9	10			11
2.0	IN PROCESS											
2.1	Wire Drawing	1. Size	MA	Dimensional	Plant Mfg. Std.	BS-EN-60228 & Appd. Datasheet	BS-EN-60228 & Appd. Datasheet	Inpection Report	2	-	1	* Sample from each armour size/ Batch / Lot
		2. Surface finish	MA	Visual	-do-	Surface shall be smooth	Surface shall be smooth	-do-	2	-	1	
		3. Phy.and Elec. Properties	CR	Physical & Electrical Tests	Sample*	Relevant. BS & Mfr. Std.	Relevant. BS & Mfr. Std.	-do-	2/3	-	2	
2.2	Stranding of wires	1. No. of wires	MA	Counting	Plant Mfg. Std.	BS-EN-60228 & Appd. Datasheet	BS-EN-60228 & Appd. Datasheet	Inpection Report	2	-	-	
		2. Resistance	CR	Electrical	-do-	-do-	-do-	-do-	2	-	-	
		3. Sequence, lay length & Direction	MA	Visual, Meas.	One Sample of each size/ 100%	Mfrs Std. / Appd. Datasheet	Mfrs Std. / Appd. Datasheet	-do-	2	-	-	
		4. Surface Finish	MA	Visual	One Sample of each size/ 100%	Surface shall be smooth	Surface shall be smooth	-do-	2	-	-	
		5. Dimension	MA	Measurement	One Sample of each size/ 100%	BS-EN-60228 & Appd. Datasheet	BS-EN-60228 & Appd. Datasheet	-do-	2	-	-	
2.3	Glass Mica tape	1. Dimensions	MA	Measurement	100%	Appd. datasheet	Appd. datasheet	Inpection Report	2	-	-	
		2. Dia over tape	MA	Measurement	Sample	-do-	-do-	-do-	2	-	-	
		3.Mica tape overlap	MA	Measurement	Sample	-do-	-do-	-do-	2	-	-	
2.4	Core Insulation (XLPE) (No repair permitted)	1. Surface finish	MA	Visual	100%	Free from bulging, burnt particles, lumps, cuts & scratches	Free from bulging, burnt particles, lumps, cuts & scratches	Inpection Report	2	-	1	# To be checked at starting & finished end of extruded length.
		2. Ovality	CR	Measurement	One Sample of each size/ lot	BS 7846 & Appd. Datasheet	BS 7846 & Appd. Datasheet	-do-	2	-	1	
		3. Insulation Thickness	CR	Measurement	-do-	-do-	-do-	-do-	2	-	-	
		4. Dia over insulation	MA	Measurement	-do-	-do-	-do-	-do-	2	-	-	
		5. Tensile Strength & % Elongation	MA	Mechanical	100%	-do-	-do-	-do-	2	-	-	
		6. spark test or water immersion test	CR	Electrical	100%	BS EN 62230 ,Mfrs Std.	BS EN 62230 ,Mfrs Std.	Inpection Report	2	-	1	
BHEL			PARTICULARS			BIDDER/VENDOR						
			NAME									
			SIGNATURE									
			DATE						BIDDER'S/VENDORS COMPANY SEAL			

		STANDARD QUALITY PLAN		CUSTOMER :			PROJECT TITLE			SPECIFICATION : NUMBER :		
				BIDDER/ VENDOR :			QUALITY PLAN NUMBER: PE-QP-999-507-E006B R0			SPECIFICATION : TITLE		
		SHEET 5 OF 11			SYSTEM			ITEM : LT XLPE Fire survival Cables			SECTION VOLUME II	
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1	DCS CRE PANEL-47											
2.5	Core Laying	1. Dia over laid up core 2. Sequence of lay & direction 3. Lay Length	MA MA MA	Measurement Visual & Meas. Measurement	One Sample of each size/ -do- -do-	BS-6724, BS-7846 / Mfr. Std. -do- -do-	BS-6724, BS-7846 / Mfr. Std. -do- -do-	Inspection Report -do- -do-	2 2 2	- - -	- - -	(Pimple, fish eye, porosity & burnt particles not permitted.)
2.6	InnerSheath Extrusion	1. Surface finish 2. Thickness 3. Dia over inner sheath	MA CR MA	Visual Measurement -do-	100% One Sample of each size/ -do-	Surface shall be smooth Appd. Datasheet -do-	Surface shall be smooth Appd. Datasheet -do-	Inspection Report -do- -do-	2 2 2	- - -	- - -	
2.7	Armour	1. No.of wires/Strips 2. Lay length & Direction 3. Dia over armouring 4. Coverage	MA MA MA MA	Counting Visual & Meas. Measurement Measurement	At the start of the process -do- -do- -do-	BS-6724, BS-7846 & Appd. Datasheet BS-6724, BS-7846 & Mfr. Std. BS-6724, BS-7846 & Appd. Datasheet -do-	BS-6724, BS-7846 & Appd. Datasheet BS-6724, BS-7846 & Mfr. Std. BS-6724, BS-7846 & Appd. Datasheet -do-	Inspection Report -do- -do- -do-	2 2 2 2	- - - -	- - - -	
BHEL			PARTICULARS			BIDDER/VENDOR						
			NAME									
			SIGNATURE									
			DATE						BIDDER'S/VENDORS COMPANY SEAL			

			STANDARD QUALITY PLAN			CUSTOMER :		PROJECT TITLE		SPECIFICATION : NUMBER :		
						BIDDER/ VENDOR :		QUALITY PLAN NUMBER: PE-QP-999-507-E006B R0		SPECIFICATION : TITLE		
			SHEET 6 OF 11			SYSTEM			ITEM : LT XLPE Fire survival Cables		SECTION	
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	P	W	V	REMARKS
1	2	3	4	5	6	7	8	9	10			11
2.8	Over Sheath Extrusion (No repair permitted)	1. Surface finish 2. Sheath Thickness 3. Dia over outer sheath 4. Embossing/ Sequential Marking	MA CR MA MA	Visual Measurement -do- Visual	100% One Sample of each size/ -do- 100%	Surface shall be smooth BS-6724, BS-7846 & Appd. Datasheet -do- Approved data sheet	Surface shall be smooth BS-6724, BS-7846 & Appd. Datasheet -do- Approved data sheet	Inspection Report -do- -do- -do-	2 2 2 2	- - - -	- - - -	(Pimple, fish eye, porosity & burnt particles not permitted.)
3.0	Finished Cable (INTERNAL)	1. Routine Test (Refer Note-G)	CR	Electrical Tests & Measurement	100%	BS-6724, BS-7846 & Appd. Datasheet	BS-6724, BS-7846 & Appd. Datasheet	Test Report	2	-	1	
4.0	Final Inspection (EXTERNAL)	1. Finish	MA	Visual	One drum in each Lot	BS-6724, BS-7846 & Appd. Datasheet	Free from Porosity, Bulging, Burnt particles,lumps, cuts & Approved Data Sheet	Test Report	2	1	-	
		2. Dimension	MA	Measurement	-do-	-do-	-do-	-do-	2	1	-	
		3. Armouring - Coverage No.of Wires	MA	Visual & Meas.	-do-	-do-	-do-	-do-	2	1	-	
	BHEL		PARTICULARS			BIDDER/ VENDOR						
			NAME									
			SIGNATURE									
			DATE						BIDDER'S/VENDORS COMPANY SEAL			

बी एच ई एल BHEL			STANDARD QUALITY PLAN		CUSTOMER :			PROJECT			SPECIFICATION :		
BIDDER/ : VENDOR					QUALITY PLAN NUMBER: PE-QP-999-507-E006B R0			SPECIFICATION : TITLE					
SHEET 7 OF 11			SYSTEM			ITEM : LT XLPE Fire survival Cables			SECTION		VOLUME II		
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS	
									P	W	V		
1	2	3	4	5	6	7	8	9	10			11	
5.0	Packing	4. Marking & Colour coding	MA	Visual	BS-6724, BS-7846 & Approved Data Sheet	-do-	BS-6724, BS-7846 & Approved Data Sheet	-do-	2	1	-	# Refer Annexure to QAP enclsloed	
		5. Sample Tests (Refer Note-G)	CR	Phy, Elect. Tests FRLS Tests	Sample #	-do-	-do-	-do-	2	1	-		
		6. Type Tests (Refer Note-G)	CR	Physical & Electrical Tests	Sample #	-do-	-do-	-do-	2	1	-		
		Sealing Identification	MA	Visual	100%	As per relevant BS	As per Mfr. Std.	-do-	2	1	-		

NOTES:-

- (A) JOINTS IN WIRE SHALL BE AS PERMITTED BY BS / BHEL SPECIFICATION, VENDOR TO CERTIFY THE SAME.
 (B) NO REPAIR OF CORE INSULATION PERMITTED
 (C) CABLE ENDS SHALL BE SEALED AS PER MANUFACTURERS STANDARD
 (D) RECORD OF RAW MATERIAL, PROCESS & ALL STAGES SHALL BE CERTIFIED BY VENDORS QC. AND ARE LIABLE TO AUDIT CHECK BY PURCHASER.
 (E) FILLERS/DUMMY CORES ETC. SHALL BE AS PER APPROVED DATA SHEET
 (F) VENDOR SHALL FURNISH COMPLIANCE CERTIFICATE TO THE INSPECTION AGENCY CONFIRMING THE PACKING AS PER BHEL SPECIFICATION.
 (G) **FOR LIST OF ROUTINE, TYPE & SAMPLE TESTS, REFER ANNEXURE TO QAP ENCLOSED.**

LEGEND : P : PERFORMER W: WITNESSER V: VERIFIER 1- BHEL / TSGENCO 2-VENDOR 3- SUB VENDOR CHP: CUSTOMER HOLD POINT WHICH WILL BE DECIDED AT CONTRACT STAGE

		BHEL			PARTICULARS	BIDDER/ VENDOR			
					NAME				
					SIGNATURE				
					DATE				BIDDER'S/VENDORS COMPANY SEAL

	ANNEXURE TO QAP	CUSTOMER: IB THERMAL POWER STATION, BANHARPALLI	PROJECT TITLE: 4X270 MW TSGENCO BHADRADRI TPS	SPECIFICATION NUMBER: PE-TS-411-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E006B R0	SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES
	SHEET 9 of 12	SYSTEM	ITEM: LT XLPE FIRE SURVIVAL CABLES	DOC. NO.

TYPE/ SAMPLE/ ROUTINE TEST REQUIREMENTS

A. Type Test Conduction:

1. Tests for which "T" is indicated in the 'Test Conduction Required As' column below shall be conducted as Type Test.
2. Sampling:
 - a) Type test to be conducted on one size / lot.
 - b) FR-LS Tests, Fire Survival tests, Flammability tests & Electrical Tests to be conducted on all sizes / lot.

B. Sample Test Conduction:

1. Tests for which "S" is indicated in the 'Test Conduction Required As' column below shall be conducted as Acceptance tests.
2. Sampling:

Acceptance tests shall be carried out on Three Samples/Lot.

C. Routine Test Conduction:

1. Tests for which "R" is indicated in the 'Test Conduction Required As' column below shall be conducted as Routine tests.
2. Sampling:

Routine tests shall be conducted on 100% drums.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
1.0	Tests for Conductor				
I.	Persulphate test	For copper conductor only	T,S	Relevant BS	
II.	Annealing test	For copper conductor only	T, S	Relevant BS	<i>Internal in process Test Report to be furnished for acceptance test</i>
III.	Tensile test	For aluminium conductor only <i>(Not applicable for compacted circular or shaped conductor)</i>	T, S	Relevant BS	
IV.	Wrapping test	For aluminium conductor only <i>(Not applicable for compacted circular or shaped conductor)</i>	T, S	Relevant BS	
V.	Conductor Resistance test	For Al/Cu	T, S, R	BS 60228	
2.0	Tests for Armour Wires				

BHEL	PARTICULARS	BIDDER/ VENDOR	
	NAME		
	SIGNATURE		
	DATE		BIDDER'S / VENDORS COMPANY SEAL

	ANNEXURE TO QAP	CUSTOMER: IB THERMAL POWER STATION, BANHARPALLI	PROJECT TITLE: 4X270 MW TSGENCO BHADRADRI TPS	SPECIFICATION NUMBER: PE-TS-411-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E006B R0	SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES
	SHEET 10 of 12	SYSTEM	ITEM: LT XLPE FIRE SURVIVAL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
I.	Measurement of dimensions/ Wire Armour Diameter		T,S	BS 7846/ BS 6724	
II.	Mass of Zinc coating test	For G. S. wires only	T	BS 7846/ BS 6724	
III.	Wrapping Test	For G. S. wires only	T	BS 7846/ BS 6724	
IV.	Armour Resistance test		T, R	BS 7846/ BS 6724	
3.0	<u>Test for Fire Barrier Tape</u>				
I.	Test for minimum thickness	Fire barrier tape	T,S	Relevant BS	
4.0	<u>Tests for GP8 (XLPE) insulation</u>				
I.	Material		T	BS 7655-1.3	
II.	Test for thickness		T,S	BS 7846/ BS 6724/ BS EN 50396	
III.	Spark Test		R	BS EN 62230	<i>Internal in process Test Report to be furnished for acceptance test</i>
IV.	Tensile strength and elongation test at break		T,S	BS 7655-1.3	
V.	Ageing in air oven		T	BS 7655-1.3	
VI.	Insulation resistance		T,S	BS 7655-1.3	
VII.	Hot set test		T,S	BS 7655-1.3	
VIII.	Water absorption test		T	BS 7655-1.3	
IX.	Shrinkage of insulation		T	BS EN 60811-502	
X.	Abrasion	On Completed cable	T	BS 7846/ BS 6724	
XI.	Power factor & permittivity test		S	BS 6469-99.2	
5.0	<u>Test for Inner Sheath (Bedding)</u>				
I.	Physical Properties		T	BS EN 60811-501	

BHEL	PARTICULARS	BIDDER/ VENDOR	
	NAME		
	SIGNATURE		
	DATE		BIDDER'S / VENDORS COMPANY SEAL

	ANNEXURE TO QAP	CUSTOMER: IB THERMAL POWER STATION, BANHARPALLI	PROJECT TITLE: 4X270 MW TSGENCO BHADRADRI TPS	SPECIFICATION NUMBER: PE-TS-411-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E006B R0	SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES
	SHEET 11 of 12	SYSTEM	ITEM: LT XLPE FIRE SURVIVAL CABLES	DOC. NO.

<u>S. No.</u>	<u>TEST</u>	<u>APPLICABLE FOR</u>	<u>TEST CONDUCTION REQUIRED AS</u>	<u>REFERENCE STANDARD</u>	<u>REMARKS</u>
II.	Test for thickness		T,S	BS 7846/ BS 6724/ BS EN 50396	
III.	Corrosive and acid gas emission		T	BS EN 50267-2-1	
6.0	Test for Over Sheath				
I.	Physical Properties		T	BS 7655-6.1	
II.	Test for thickness		T,S	BS 7846/ BS 6724/ BS EN 50396	
III.	Spark test		R	BS EN 62230	<i>Internal in process Test Report to be furnished for acceptance test</i>
IV.	Corrosive and acid gas emission		T	BS EN 50267-2-1	
V.	Shrinkage of over sheath	For complete cable	T	BS 7846/ BS 6724	
VI.	IR constant of over sheath	For complete cable	T	BS 7846/ BS 6724	
7.0	FR-LS Tests				
I.	Oxygen Index test	For Over sheath only	T, S	ASTMD-2863	
II.	Temperature index test	For Over sheath only	T, S	ASTMD-2863	
III.	Smoke density test	For Over sheath only	T, S	ASTMD 2843	
IV.	Smoke Emission Test	For complete cable	T, S	BS EN 61034-2	
V.	Acid Gas Generation test	For complete cable	T, S	IEC 60754-1	
8.0	Electrical Tests				
I.	High Voltage Test	For complete cable	T,R	Relevant BS	
II.	Insulation Resistance Test (Volume resistivity method)	For Over sheath only	T	BS 7846/ BS 6724	
9.0	Compatibility	For complete cable	T	BS 7846/ BS 6724	
10.0	Fire Survival Test	For complete cable	T,S	BS 6387/ IEC-60331-1	
11.0	Flammability Tests				
I.	Flame propagation on multiple cables	For complete cable	T	BS EN 60332-3-24	

BHEL	PARTICULARS	BIDDER/ VENDOR	
	NAME		
	SIGNATURE		
	DATE		BIDDER'S / VENDORS COMPANY SEAL

	ANNEXURE TO QAP	CUSTOMER: IB THERMAL POWER STATION, BANHARPALLI	PROJECT TITLE: 4X270 MW TSGENCO BHADRADRI TPS	SPECIFICATION NUMBER: PE-TS-411-507-E005
		BIDDER/VENDOR:	QUALITY PLAN NUMBER : PE-QP-999-507-E006B R0	SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR LT XLPE FIRE SURVIVAL CABLES
	SHEET 12 of 12	SYSTEM	ITEM: LT XLPE FIRE SURVIVAL CABLES	DOC. NO.

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
II.	Flame propagation on single cable	For complete cable	T,S	IEC-60332-1-2	
III.	Swedish chimney test	For complete cable	T	SEN SS 424 1475 (Class F3)	
12.0	<u>Anti-rodent and Termite Repulsion test</u>	For outer sheath only	S	--	Test applicable if indicated in Datasheet-A
13.0	<u>Special Tests</u>				
I.	Ultraviolet Test	For complete cable	**	BS EN ISO 4892-2/ ASTM G 154	Test applicable if indicated in Datasheet-A

**** These tests shall be conducted on one sample for the entire contract and duration of these tests shall be 14 days.**

BHEL	PARTICULARS	BIDDER/ VENDOR	
	NAME		
	SIGNATURE		
	DATE		BIDDER'S / VENDORS COMPANY SEAL