



Technical Specification For
3.3kV,11kV, Aluminum HT XLPE Power
cable

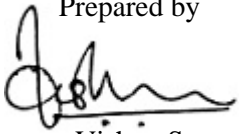
Specification no

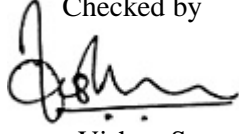
3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I

IS-1-17-2005/017

CONTENTS

Sl. No.	Section	Particulars	Page No
1	Section-I	Project information	2
2	Section-II	Standards and codes	4
3	Section-III	Scope of supply	5
4	Section-IV	Detailed Technical Specification	6
5	Section-V	Inspection & Testing	10
6	Section-VI	Packing & Marking	12
7	Section-VII	Documentation	12
8	Section-VIII	Information to be furnished along with the offer	13
9	Annexure-1	NTPC Approved Standard QAP	1 Sheet

Prepared by

Vishnu S
Manager
Engineering (Electrical)

Checked by

Vishnu S
Manager
Engineering (Electrical)

Approved by

Sangeetha MA
Dy. General Manager
Engineering (Electrical)



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

SECTION – I

PROJECT INFORMATION

1.0.1 BACKGROUND

A Memorandum of Agreement (MOA) has been entered on 29.07.2015 amongst Govt. of Jharkhand (GoJ), Jharkhand Urja Vikash Nigam Limited (JUVNL), Jharkhand Urja Utpadan Nigam Limited (JUUNL), Jharkhand Bijli Vitaran Nigam Limited (JBVNL) and NTPC Limited to form a Joint Venture Company of NTPC Limited & JBVNL for transfer of Patratu Thermal Power Station (PTPS) located in Ramgarh District of Jharkhand State to the proposed JV Company for Performance Improvement of existing capacity & 4000 MW Capacity expansion of PTPS.

Further to signing of JV agreement on 29.07.2015, a Joint Venture Company namely Patratu Vidyut Utpadan Nigam Limited (PVUNL) has been incorporated amongst GoJ, JUVNL, JBVNL and NTPC Ltd. on 15.10.2015. The Performance Improvement of existing capacity and 4000 MW Capacity expansion of Patratu STPS will be implemented by the JV Company (JVC). The configuration of expansion of 4000 MW shall consist of 5 units of 800 MW to be implemented in two phases;

Phase-I: 3x800 MW and Phase-II: 2x800 MW.

The present proposal is for Patratu STPS Phase-I (3x800 MW). The project is envisaged to be commissioned during XIII Plan period.

1.0.2 Location and Approach

Patratu Thermal Power station (PTPS) is located just outside the coal belt of South Karanpura in Ramgarh District of Jharkhand State. The nearest Railway Station is Patratu which is at a distance of about 4 km on Barkakhana-Barwadih Railway line.

Major rail/road distances from the project site are as under:

City Distance Approx. (kms)

Patratu 4 kms

Ranchi 60 kms

Corner name	Latitude	Longitude
Top Corner	23° 38 ' 60 " N	85° 17 ' 51.5" E
Bottom Corner	23° 38 ' 12.5 " N	85° 17 ' 27 " E
Left Corner	23° 38 ' 22.5 " N	85° 17 ' 10.6 " E
Right Corner	23° 38 ' 40 " N	85° 17 ' 57 " E

Further to the information given in this sub-section, Bidders are also advised to visit the project site and collect data on local site conditions.



Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable

Specification no

3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I

IS-1-17-2005/017

1.0.3 Land

The total land to be transferred to JV Company is 1859 acres. Out of 1859 acre, about 1234 acres of land has been envisaged for Plant, Ash pond and Land on railway track of the for Phase-I (3x800 MW). The balance 625 acre of land shall be transferred during commencement of Phase-II (2x800 MW).

1.0.4 General site conditions

For the purpose of design of equipment/systems, an **ambient temperature of 50 deg.** Centigrade and relative humidity of 95% shall be considered. The equipment shall operate in a highly polluted environment. However, for equipment in air conditioned areas, design ambient temperature shall be 35 deg.C, if 2x100% air conditioning system is provided.

	Power Supply	
1	Voltage	11kV & 3.3kV, 3 phase, 50 Hz
2	System Fault level	50KA for 11 KV and 40 kA for 3.3KV, RMS for 1 sec
3	Voltage Variation	± 5%
4	Frequency variation	+3% to - 5%
5	Combined variation	± 5% Absolute
6	Earthing	Neutral solidly earthed



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

SECTION – II

STANDARDS AND CODES

The design, material, construction, manufacture, inspection, testing and performance of HT XLPE POWER CABLES shall conform to the latest revision of relevant International Electro-Technical Commission (IEC) / ASTM and other reputed standards and codes of practices mentioned in this specification and any other International standard as applicable.

1.0 STANDARDS AND CODES

All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those (IS: codes, standards, etc.) referred to herein, the former shall prevail. All the cables shall conform to the requirements of the following standards and codes:

IS:7098 (Part -II)	Specification for Cross linked polyethylene insulated PVC sheathed cables. Part-II: For working voltages from 3.3 KV upto and including 33 KV.
IS : 3975	Low Carbon Galvanized steel wires, formed wires and tapes for armouring of cables.
IS : 4905	Methods for random sampling.
IS : 5831	PVC insulation and sheath of electrical 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.
IEC-754 (Part-I)	Tests on gases evolved during combustion of electric cables.
IEC-332	Tests on electric cables under fire conditions. Part-3: Tests on bunched wires or cables (Category-B).



Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable

Specification no

3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I

IS-1-17-2005/017

SECTION – III

SCOPE OF SUPPLY

This specification covers the design, manufacture, inspection and testing at manufacturer's works, proper transportation worthy packing and delivery of HT XLPE POWER CABLES as mentioned in different sections of this specification.

It is not the intent to specify herein all the details of design & manufacture. However, the cables shall conform in all respect to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation.

Item wise quantity requirement is mentioned in below table

Sl. No.	TYPE	QTY in Meters
1	3.3KV, 3C X 150 Sqmm, Al Cond. XLPE insulated armoured cable - A2XFY	29500
2	3.3KV, 3C X 240 Sqmm, Al Cond. XLPE insulated armoured cable - A2XFY	1500
3	3.3KV, 1C X 185 Sqmm, Al Cond. XLPE insulated armoured cable - A2XWaY	14000
4	11KV, 3C X 185 Sqmm, Al Cond. XLPE insulated armoured cable - A2XFY	11500
5	11KV, 1C X 300 Sqmm, Al Cond. XLPE insulated armoured cable - A2XWaY	7500
6	11KV, 1C X 630 Sqmm, Al Cond. XLPE insulated armoured cable - A2XWaY	8500



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

SECTION – IV

DETAILED TECHNICAL SPECIFICATION

4.1 TECHNICAL SPECIFICATION:

S.NO.	ITEM	PARTICULARS
1	REFERENCE STANDARD	IS-7098 PART-II IN GENERAL
2	SYSTEM VOLTAGE	11 KV & 3.3 KV
3	VOLTAGE GRADE OF CABLES	11/11KV (UE) 3.3/3.3 KV (UE)
4	CONDUCTOR	
(a)	REFERENCE STANDARD	IS-8130
(b)	MATERIAL	STRANDED ALUMINIUM H4 GRADE CLASS 2
(c)	SHAPE	COMPACTED CIRCULAR
(d)	SIZES (NO. OF CORES -CROSS-SECTIONAL AREA)	
	(i) 11 KV SYSTEM	3C-185 (ARMOURED), 1C-300 (ARMOURED), 1C-630 (ARMOURED)
	(ii) 3.3KV SYSTEM	3C-150 (ARMOURED) , 3C-240 (ARMOURED), 1C-185 (ARMOURED)
5	CONDUCTOR SCREENING	EXTRUDED SEMI-CONDUCTING COMPOUND
6	INSULATION	
(a)	REFERENCE STANDARD	IS-7098 PART-II
(b)	MATERIAL	EXTRUDED XLPE
7	INSULATION SCREENING	
(i)	NON METALLIC	
(a)	REFERENCE STANDARD	IS-7098 PART -II
(b)	MATERIAL	EXTRUDED SEMI-CONDUCTING COMPOUND
(ii)	METALLIC	COPPER TAPE SIZED FOR CARRYING EARTH FAULT CURRENT OF 600A FOR 2 SEC except for Single Core Armoured Cables
8	INNER SHEATH	
(a)	REFERENCE STANDARD	IS-5831 & IS-7098 PART II
(b)	MATERIAL	EXTRUDED PVC TYPE ST2
(C)	COLOR	BLACK
9	ARMOUR (WHERE EVER APPLICABLE)	
(a)	SINGLE CORE CABLES	
(i)	REFERENCE STANDARD	IS- 3975 & IS- 7098 PART II
(ii)	MATERIAL	NON-MAGNETIC HARD DRAWN ALUMINIUM GRADE H4
(iii)	SHAPE	ROUND WIRE
(b)	MULTI-CORE CABLES	
(i)	REFERENCE STANDARD	IS 3975 & IS 7098 PART II
(ii)	MATERIAL	GALVANISED STEEL



Technical Specification For 3.3kV, 11kV, Aluminum HT XLPE Power cable

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

(iii)	SHAPE	ROWND WIRE/STRIP
10	OUTER SHEATH	
(i)	REFERENCE STANDARD	IS 5831 & IS 7098 PART II
(ii)	MATERIAL	EXTRUDED FRLS PVC TYPE ST2
(iii)	COLOR	BLACK

4.2 TECHNICAL REQUIREMENTS:

- The cables shall be suitable for laying on racks, in ducts, trenches, conduits and underground (buried) installation with chances of flooding by water.
- All cables shall be flame retardant, low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses developed under steady state and transient operating conditions as specified elsewhere in this specification.
- Aluminum conductor used in power cables shall have tensile strength of more than 100 N/ sq.mm. Conductors shall be multi stranded.
- XLPE insulation shall be suitable for continuous conductor temperature of 90 deg. C and short circuit conductor temperature of 250 deg.C.
- The cable cores shall be laid up with fillers between the cores wherever necessary. It shall not stick to insulation and inner sheath. All the cables, other than single core unarmored cables, shall have distinct extruded PVC inner sheath of black colour as per IS: 5831.
- For single core armoured cables, armouring shall be of aluminum wires. For multicore armoured cables armouring shall be of galvanised steel as follows: -

Calculated nominal dia of cable under armour	Size and Type of armour
i) Up to 13 mm	1.4mm dia GS wire
ii) Above 13 & up to 25mm	0.8 mm thick GS formed wire / 1.6 mm dia GS wire
iii) Above 25 & up to 40 mm	0.8mm thick GS formed wire / 2.0mm dia GS wire
iv) Above 40 & up to 55mm	1.4 mm thick GS formed wire/2.5mm dia GS wire
v) Above 55 & up to 70mm	1.4 mm thick GS formed wire/3.15mm dia GS wire
vi) Above 70mm	1.4 mm thick GS formed wire / 4.0 mm dia GS wire

- The aluminum used for armouring shall be of H4 grade as per IS: 8130 with maximum resistivity of 0.028264 ohm-sq.mm/mtr at 20 deg.C. The types and sizes of aluminum armouring shall be same as for galvanised steel as mentioned above.
- The gap between armour wires / formed wires shall not exceed one armour wire / formed wire space and there shall be no cross over / over-riding of armour wires / formed wires. The minimum area of coverage of armouring shall be 90%. The breaking load of armour joint shall not be less than 95% of that of armour wire / formed wire. Zinc rich paint shall be applied on armour joint surface of GS wires/formed wires. (not applicable)



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

9. Distinct extruded PVC inner sheath of black colour as per IS:5831 shall be provided for the cables as follows:
 - a). For all multicore cables.
 - b). For single core armoured cables, where armouring is not being used as metallic screen.
10. Outer sheath shall be of PVC black in colour. 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 (Test method as per IS 10810 Part-58)
 - (b.) Acid gas emission of max. 20% as per IEC-754 (Part-I)
 - (c.) Smoke density rating shall not be more than 60% during Smoke Density Test as per ASTM-D-2843.
11. Cores of three core cables shall be identified by colouring of insulation or by providing coloured tapes helically over the cores, with Red, Yellow & Blue colours.
12. 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) Screen Fault current __ _KA for __ _ Sec. (Value of current & time shall be indicated)
 - (d) Sequential marking of length of the cable in meters at every one meter - To be embossed / printed
 - (e) The embossing / printing shall be progressive, automatic, in line and marking shall be legible and indelible.
13. All cables shall meet the fire resistance requirement as per Category-B of IEC-332 Part-3.
14. Allowable tolerances on the overall diameter of the cables shall be ± 2 mm maximum over the declared value in the technical data sheets.
15. In plant repairs to the cables shall not be accepted. Pimples, fish eye, blow holes etc. are not acceptable.
16. The cross-sectional area of the metallic screen strip/tape/wires shall be considered in sizing calculations.
17. The eccentricity shall be calculated as

$$\frac{T_{\max} - T_{\min}}{T_{\max}} \times 100$$

and the ovality shall be calculated as

$$\frac{D_{\max} - D_{\min}}{D_{\max}} \times 100$$

Where T_{\max}/T_{\min} is the maximum / minimum thickness of insulation and

D_{\max}/D_{\min} is the maximum / minimum diameter of the core.

The eccentricity of the core shall not exceed 10% and ovality not to exceed 2%.



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

4.3 CONSTRUCTION DETAILS

11/11KV, 6.6/6.6KV Grade Power Cables:

Cables shall conform to IS-7098 Part-II. These cables shall be multi-stranded, compacted circular aluminium conductor, XLPE-insulated, metallic screened, PVC outer sheathed. The conductor screen and insulation screen shall both be of extruded semiconducting compound and shall be applied along with the XLPE insulation in a single operation of triple extrusion process so as to obtain continuously smooth interfaces. Method of curing shall be "dry curing / gas curing / steam curing". The metallic screen for each core shall be capable of carrying the system earth fault current and shall consist of copper wires or tape with minimum overlap of 20%. However, for single core armoured cables, the armouring shall constitute the metallic part of the screening

3.3/3.3kV Grade Power Cables:

Cables shall conform to IS: 7098 Part - II. These cables shall be multi- stranded, compacted. circular aluminium conductor, XLPE insulated, metallic screened, PVC outer sheathed. The metallic screen of each core shall consist of copper wires or tape with minimum overlap of 20%. However, for single core armoured cables, the armouring shall constitute the metallic part of the screening. The metallic screen of each core shall be capable of carrying the system earth fault current Method of curing for cables shall be "dry curing / gas curing / steam curing".

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.

4.4 CABLE DRUMS

Cables shall be supplied in non-returnable wooden or steel drums of heavy construction. The surface of the drum and the outer most cable layer shall be covered with water proof 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. Wood preservative anti-termite treatment shall be applied to the entire drum. Wooden drums shall comply with IS: 10418.

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 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.

The standard length for HT power cables shall be 1000 meter for all single core cables and 750 meters for 3 core cables. The length per drum shall be subjected to a maximum tolerance of +/- 5% of the standard drum length. Overall length tolerance for each type of cable shall be +/- 2%. BHEL shall have the option of rejecting cable drums with shorter lengths.



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

SECTION – V

INSPECTION AND TESTING

The Inspection for equipment under scope shall be done in general as per Customer approved QAP/MQP, approved datasheet, specification and relevant standards which shall be submitted and approved during detailed engineering

- 5.1 The type tests shall be carried out in presence of the customer representative, for which minimum 15 days' notice shall be given by the contractor. The bidder shall obtain the customer approval for the type test procedure before conducting the type test. The type test procedure shall clearly specify the test set-up, instruments to be used, procedure, acceptance norms, recording of different parameters, interval of recording, precautions to be taken etc. for the type test(s) to be carried out.
- 5.2 In case the contractor has conducted such specified type test(s) within last ten years as on **03.03.2017**, he may submit during detailed engineering the type test reports to the owner for waiver of conductance of such type test(s). These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. The owner reserves the right to waive conducting of any or all the specified type test(s) under this contract
- 5.3 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.
- 5.4 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. All types and sizes of cables being supplied shall be subjected to type tests, routine tests and acceptance tests as specified below and according to relevant standards.
- 5.5 Inspection call shall be given at least 3 weeks in advance with all test reports. Supplier shall carryout/demonstrates various routine tests and any other test specified by Customer at supplier's works at no extra cost.
- 5.6 All reports / certificates shall bear company seal and signature of supplier / manufacturer.
- 5.7 Supplier shall produce during inspection:
 - a) Raw material inspection certificate.
 - b) In House test reports (Type test certificate shall be produced for exactly the same range/specifications)
 - c) Statutory certificates as required.
 - d) Internal inspection & Factory calibration certificate
 - e) Complete BOM including accessories.
- 5.8 All Inspection & Testing shall be carried out based on the following documents: -
 - a. Relevant Standards
 - b. Specifications
 - c. Approved Data sheets
 - d. Approved QAP



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

- 5.9 The vendor shall maintain and ensure necessary safety measures as required for inspection and tests if any test equipment is found not complying with proper safety requirements, then the inspection agency may withhold inspection till such time the desired safety requirements are met. The vendor shall submit type test certificates for similar equipment supplied by him elsewhere.
- 5.10 Charges for all tests shall be deemed to be included in the bid price. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage. Cost of cables consumed for testing shall be to bidder's account.
- 5.11 Indicative tests shall be as per the details given below and attached NTPC standard QAP (Annexure-1). Final MQP /tests shall be as per Customer approval.
- 5.12 **Type test Procedure shall be submitted to customer for approval before conducting type tests.**
- 5.13 The following type tests shall be carried out on one size each of 11/11KV and 3.3/3.3KV cables. Size shall be decided by the employer during detailed engineering

S. No	Type Test	Remarks
	Conductor	
1.	Resistance test For Armour Wires / Formed Wires	
2.	Measurement of Dimensions	
3.	Tensile Test	
4.	Elongation test	
5.	Torsion test	For round wires only
6.	Wrapping test	
7.	Resistance test	
8(a)	Mass & uniformity of Zinc Coating Tests	For GS wires/formed wires only.
8(b)	Adhesion test For XLPE insulation & PVC Sheath	For GS wires/formed wires only
9.	Test for thickness	
10.	Tensile strength and elongation test before ageing and after ageing	
11.	Ageing in air oven	
12.	Loss of mass test	For PVC outer sheath only.
13.	Hot deformation test	For PVC outer sheath only.
14.	Heat shock test	For PVC outer sheath only
15.	Shrinkage test	
16.	Thermal stability test	For PVC outer sheath only
17.	Hot set test	For XLPE insulation only



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

- | | | |
|-----|--|---------------------------|
| 18. | Water absorption test | For XLPE insulation only |
| 19. | Oxygen index test | For PVC outer sheath only |
| 20. | Smoke density test | For PVC outer sheath only |
| 21. | Acid gas generation test | For PVC outer sheath only |
| 22. | Flammability test as per IEC-332
Part-3 (Category -B) | For completed cable only |

Section VI

PACKING & MARKING

- 7.1 Cables shall be supplied in drums as per section 4.4. Cable ends are carefully protected before packing. Polyethylene sheet shall be wrapped over the cables and then sealed properly.
- 7.2 Bidder shall provide transportation worthy packing to prevent any cable damage during transportation
- 7.3 Cable drum identification/marketing will be as follows:
- a) Makers name
 - b) Consignee's full address
 - c) Type size and length of cables
 - d) Net and gross weights
 - e) Any other marking for shipping
 - f) Drum Markings

The drums shall be clearly marked with lettering "SUPPLIED THROUGH BHEL-ISG FOR CHP & AHP AREAS"

Section VII

DOCUMENTATION

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

Sl. No.	Drawings/Document Description	Drawings / Document Number
1.	Technical Data Sheet for HT XLPE Power Cables	Will be provided later
2.	Cross-sectional Drawings for HT XLPE Power Cables	Will be provided later
3.	Manufacturing Quality Plan for HT XLPE Power Cables	Will be provided later
4.	Type Test procedures for HT XLPE power cables	Will be provided later
5.	Type Test Reports for Tests conducted under this contract	Will be provided later



**Technical Specification For
3.3kV, 11kV, Aluminum HT XLPE Power
cable**

Specification no

**3 X 800MW PATRATU SUPER THERMAL
POWER STATION EXPANSION PHASE-I**

IS-1-17-2005/017

- 1) Resubmission of any document incorporating comments shall be made within 3 days
- 2) All documents to be submitted with approved Title Block and Drawing Numbering System, a soft copy of which shall be provided to successful bidder.
- 3) Test certificate shall invariably consist of customer details
- 4) If any additional document is required during detailed engineering it shall be included.
- 5) All drawings provided by the contractor shall be on standard size A4/A3 sheets, in the form of black or blue lines on a white background.
- 6) Approval of drawings shall not relieve the supplier of his responsibility in terms of the contract
- 7) All Drawing submissions shall be through BHEL-ISG online document portal (WRENCH) only. Drawings submissions through email is not acceptable

Section VIII

INFORMATION TO BE FURNISHED ALONG WITH THE OFFER

Bidder to clearly confirm that no deviation has been taken in this technical specification & referred annexures
Bidder to confirm that if relevant Type tests are not available with them, cable of identical construction will be taken up for testing immediately on receipt of LOA.