

2 X 660MW UDANGUDI STPP

TAMIL NADU GENERATION & DISTRIBUTION CORPORATION LTD.

TECHNICAL SPECIFICATION FOR EPR INSULATED FIRE SURVIVAL CABLES

VOLUME-II

SPECIFICATION NO: PE-TS-435-507-E006A

REVISION: 00



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP (INDIA) – 201301**



**TECHNICAL SPECIFICATION FOR
EPR INSULATED FIRE SURVIVAL
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VOLUME II

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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS



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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 Annexure-A [BOQ-Cum-Price schedule] of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE



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1.0 SCOPE OF ENQUIRY

- 1.1 This specification covers the Design, Manufacture, Inspection and Testing at Manufacturer's works, proper packing and delivery to site of EPR INSULATED FIRE SURVIVAL CABLES.
- 1.2 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.
- 1.3 General technical requirements of the EPR INSULATED FIRE SURVIVAL CABLES are indicated in Section-II. Project specific technical/ quality requirements / changes are listed in Section-I.
- 1.4 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.
- 1.5 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 Annexure for Bill of Quantities (BOQ) enclosed as part of NIT.

3.0 TECHNICAL REQUIREMENTS

- 3.1 Specific Technical Requirement:

<u>S.No.</u>	<u>Reference Clause No. of Section- II</u>	<u>Specific Requirement/ Change</u>
1.	4.1: Cables shall be supplied in non-returnable drums. Material of cable drums shall be as specified in Datasheet-A.	Shall be read as: "Cables shall be supplied in non-returnable drums, of heavy construction . Material of cable drums shall be as specified in Datasheet-A."
2.	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. BIS certification mark shall be stamped on each cable drum.	Shall be read as: " Construction & other details of drums shall be in line with Datasheet-A. "

- 3.2 Quality/ Inspection:

<u>S.No.</u>	<u>Reference Clause No. of Section- II</u>	<u>Specific Requirement/ Change</u>
1.	ANNEXURE-II: Standard Quality Plan: Note "C: CABLE ENDS SHALL BE	Note C shall be read as: " CABLE ENDS SHALL BE SEALED AS PER APPROVED DATASHEET. "



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	SEALED AS PER MANUFACTURERS STANDARD.”	
2.	CLAUSE 3.1: Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E006 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.	CLAUSE 3.1 shall be read as: "Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E006, R01 as attached with the specification without any deviations. At contract stage, the Standard Quality Plan as enclosed in the technical specification is to be appended with cover sheet bearing document number and description as per NIT. The signed and stamped copy of the same shall be submitted to BHEL without making any changes in the contents of the document. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage."

4.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED

- 4.1 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.
- 4.2 Documents required after award of LOI & Document/ drawing submission/ re-submission schedule shall be as per NIT.
- 4.3 All drawings/ documents indicated above shall be submitted through Document Management System (DMS).
- 4.4 Supplier to also give the following undertaking in the BOM:
"The BoM provided herewith completes the scope (in content and intent) of material supply under PO No. -----, dated -----.
Any additional material which may become necessary for the intended application of the supplied item(s)/package will be supplied free of cost in most reasonable time."



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DATASHEET A



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DATASHEET-A

1.0	Type of Cable	EPR INSULATED FIRE SURVIVAL CABLES
2.0	Standard applicable in general(Latest amendment to be referred if any)	IS-16246, IS-8130, IS-6380, IS -10810,IS 10418, IS-3975, ASTMD:2843, ASTMD-2863, IEC-60754-1, IEC-60331, IEC-60332
3.0	Voltage Grade	1.1 KV
4.0	Number of cores, cross sectional area of conductors and quantities	As per BOQ-Cum-Price Schedule
5.0	CONDUCTOR	
(a)	Material	Copper
	Grade and Class	Stranded, Tinned/ Plain, annealed high conductivity, Class 2
(b)	Standard Applicable	IS-16246, IS - 8130
(c)	Shape	Compacted circular / Shaped
(d)	Min. number and diameter of strands for main and neutral conductor.	As per class -2 of IS 8130
(e)	Fire Barrier tape	Glass Mica tape in two layers with minimum 50% overlap
6.0	INSULATION	
(a)	Material	Heat resistant Elastomer compound , type IE2
(b)	Standard Applicable	IS-16246, IS -6380
(c)	Continuous withstand temperature	90°C
(d)	Short-circuit withstand temperature	250°C
(e)	Method of application	By extrusion; sleeve extrusion not permitted.
(f)	Method of curing	Dry/Steam/Gas/Sioplas
(g)	Nominal Thickness of insulation	As per Table-3 of IS-16246
(h)	Fire proof tape	Two Layers of plain Glass Fibre Binder Tape
7.0	CORE IDENTIFICATION	Colour coding as per IS-16246
8.0	INNER SHEATH	
(a)	Material	Elastomer compound
(b)	Grade and type	Extruded Type SE-6
(c)	Standard Applicable	IS-16246
(d)	Colour	Black
9.0	ARMOUR	
(a)	Material:	
(i)	Single core cables	Single layer of Hard Drawn Aluminium Round Wire of H4 grade
	Standard Applicable	IS-16246, IS 8130
(ii)	Multi-core cables	Galvanised Steel Round Wire / Galvanised Steel Formed Wire Strip
	Standard Applicable	IS-16246, IS-3975
(b)	Gap between armour wires	Shall not exceed one armour wire space



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		(No cross-over/ over-riding)
(c)	Minimum Coverage	90%
(d)	Breaking load of joint	95 % of normal armour
		Zinc rich paint shall be applied on armour joint surface of GS wire
10.0	OUTERSHEATH	
(a)	Material	Elastomer compound
(b)	Grade and type	Extruded Type SE-6
(c)	Colour	Black
(d)	Marking	(i) CABLE SIZE (CROSS SECTION AREA AND NO. OF CORES, VOLTAGE GRADE, REF. IS, TYPE OF CABLE, TYPE OF INSULATION/ SHEATH, MANUFACTURER'S NAME AND / OR TRADE NAME, YEAR OF MANUFACTURE- AT EVERY 1M (BY EMBOSSING/ PRINTING) (ii) PROGRESSIVE SEQUENTIAL MARKING OF LENGTH OF CABLE IN METERS- AT EVERY 1M (BY EMBOSSING/ PRINTING) (iii) WORD 'FS' AT EVERY 5M (BY EMBOSSING/PRINTING) (iv) 'BHEL-PEM' and 'CUSTOMER' Name @5m (by embossing)
11.0	ELASTOMERIC INNER & OUTER SHEATH CHARACTERISTICS	
(a)	Oxygen index	≥30 (as per ASTM D 2863/ IS-16246)
(b)	Temperature Index	≥250°C (as per ASTM D-2863/ IS-16246)
(c)	Acid gas generation	≤ 2% by weight (as per IEC-60754-1/ IS-16246)
(d)	Smoke density rating	≤ 20% (As per ASTM D 2843/ IS-16246)
(e)	Flammability Test	
(i)	Flammability test for single cable	As per IS- 16246/ IEC-60332 Part-1
(ii)	Flammability test for bunched cables	As per IS- 16246/ IEC-60332 Part-3 CAT-B
(f)	Fire survival test	As per IS- 16246/ IEC-60331 for min 3 Hrs at 750°C
12.0	Allowable Tolerance on OD	±2 mm (max.)
13.0	CABLE DRUMS	
(a)	Type of Drum	Wooden Drum as per IS 10418 / Steel Drum As per Annexure I to Section II
(b)	Standard drum length	500/750m (±) 5% (as specified in BOQ-Cum-Price Schedule)
(c)	Painting	Entire surface to be painted. All ferrous parts used shall be treated with suitable rust preventive finish or coating to avoid rusting during transit or storage. Wooden cable drums shall be treated with copper naphthenates or zinc naphthenates for preserving the wood. Drum number shall be indicated on each drum.
(d)	Outermost Layer	To be covered with water-proof polyethylene
(e)	Construction	All wooden parts from seasoned wood and ferrous parts shall be treated with suitable rust preventive finish or coating. Wooden drum shall be treated by immersing in copper nitrate solution.
(e)	Particular information on Drum	Both the end of cables shall be properly sealed with heat shrinkable seal secured by 'U' nails so as to eliminate ingress of water during transportation, storage & erection. The cable drums shall carry the following details in printed form: A) Manufacturer's name or trade make



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		B) 'CUSTOMER' Name C) type of cable & voltage grade D) year of manufacture E) type of insulation F) no. Of core and sizes of cables G) cable code e.g. fs H) single length of cable on drum I) direction of rotation, by arrow J) approx gross mass
--	--	---

NOTE: Suitable fire retardant material fillers shall be used for filling in the interstices. Two layers of plain glass binder tape should be applied over the laid up cores.

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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 EPR 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			



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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 85 deg. C	ohm/km	
g)	A.C. resistance of conductor at 90 deg. C	ohm/km	
h)	Reactance of cable at normal frequency	ohm/km	
i)	Electrostatic capacitance of cable at normal frequency	mF/km	
j)	Maximum conductor temperature	deg. C	
k)	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 85/90 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	-	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

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3.9	INNERSHEATH		
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		
a)	Voltage variation	%	
b)	Frequency Variation	%	
c)	Combined voltage & frequency	lAbsl	
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		

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			



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	CABLE & MULTIPLE CABLES		
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	Minimum Tensile strength	N/mm ²	
17.0	Minimum elongation percentage at rupture		
18.0	Weight of cable / components	kg./m	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			

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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	-	
19.0	Shipping Weight	kg	
20.0	Cable marking on outer sheath	-	

NAME OF VENDOR			SEAL	REV.	
NAME	SIGNATURE	DATE			



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SECTION-II

STANDARD TECHNICAL SPECIFICATION



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1.0 TECHNICAL REQUIREMENTS

1.1 Technical requirements for EPR INSULATED 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 EPR INSULATED 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-E006 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

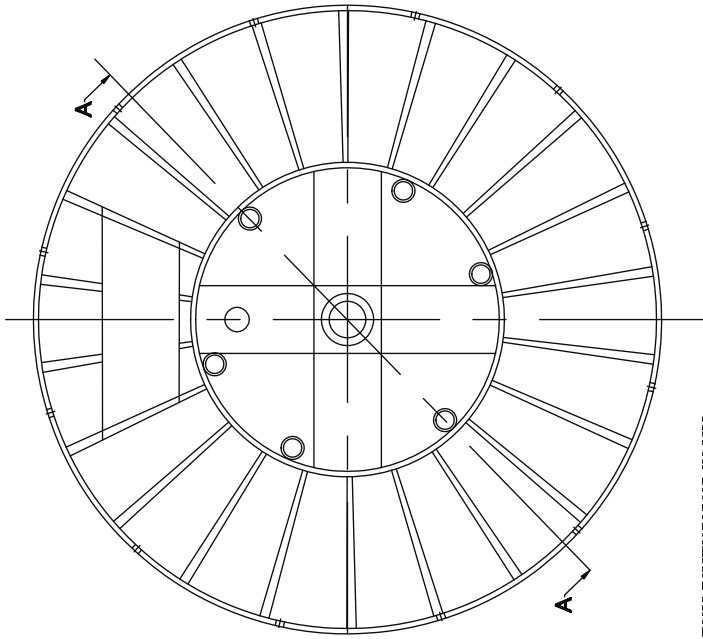
4.1 Cables shall be supplied in non-returnable drums. Material of cable drums shall be as specified in Datasheet-A.

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. BIS certification mark shall be stamped on each cable drum.

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 EPR INSULATED FIRE SURVIVAL CABLES.

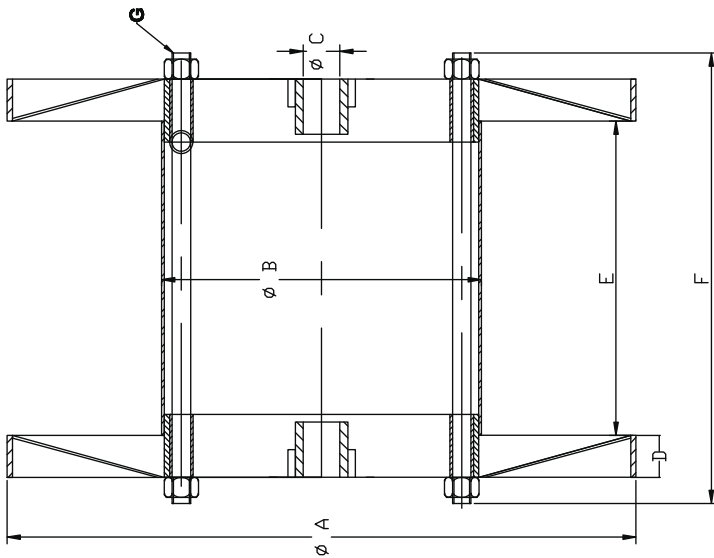
ANNEXURE-I TO SECTION-II

- Dwg. not to scale.
- ALL DIMENSIONS ARE IN MM.



APPROXIMATE DRUM DIMENSIONS IN MM
 ALL DIMENSIONS AND VALUES ARE
 TYPICAL AND ARE DEPENDENT ON
 CABLE WEIGHT.

A	FLANGE	2200
B	BARREL	1200
C	CENTRAL HOLE	100
D	FLANGE	50
E	TRAVERSE	1400
F	GROSS WIDTH	1600
G	STUD SIZE	16 MM.





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ANNEXURE-II


QUALITY PLAN

STANDARD QUALITY PLAN		CUSTOMER		PROJECT: 2X660 MW UDANGUDI SUPERCRITICAL STPP ST-I		SPECIFICATION NUMBER: PE-TS-435-507-E006A, R0				
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SL. NO.	COMPONENT/ OPERATION CHECK	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	SECTION AGENCY	FORMAT OF RECORD	VOLUME II REMARKS
1	2	3	4	5	6	7	8	9	10	11
1.0	RAW MATERIALS & BOUGHT OUT ITEMS									
1.1	Aluminium/copper Rods (Conductor/Armour Wire)	<p>GENERAL :</p> <p>1. Physical properties</p> <p>2. Elec.Properties</p> <p>SPECIFIC CHECKS :</p> <p>a) Make</p> <p>b) Grade</p> <p>c) Resistivity</p>	MA	Physical Tests	Sample/ Batch	IS 16246, IS 8130 & Appd Datasheet	IS 16246, IS 8130 & Appd Datasheet	IS 16246, IS 8130 & Appd Datasheet	Inspection Report/ Test Cert.	2/3
			MA	Electrical Tests	Sample/ Batch	-do-	-do-	-do-	-do-	1/2
			MA	Verify	100%	Manufacturer approved source	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	1
			MA	-do-	-do-	IS 8130/ Approved datasheet	IS 8130/ Approved datasheet	IS 8130/ Approved datasheet	-do-	1
			MA	Electrical Tests	Manufacturer std.	IS 8130	IS 8130	IS 8130	-do-	1
1.2	Insulation (EPR) Copmpound	<p>GENERAL :</p> <p>1. Physical properties</p> <p>2. Elec.Properties</p> <p>SPECIFIC CHECKS :</p> <p>a) Make</p> <p>b) Type/ Grade</p> <p>c) Shelf life/ Storage condition</p>	MA	Physical Tests	Sample/ Batch	IS 16246, IS 6380 & Appd Datasheet	IS 16246, IS 6380 & Appd Datasheet	IS 16246, IS 6380 & Mfs Std./ Approved datasheet	Inspection Report/ Test Cert.	2/3
			MA	Electrical Tests	Sample/ Batch	-do-	-do-	-do-	-do-	1/2
			MA	Verify	100%	Manufacturer approved source	Manufacturer approved source	Manufacturer approved source	COC/ Test Cert.	1
			MA	-do-	-do-	Approved datasheet	Approved datasheet	Approved datasheet	-do-	1
			MA	-do-	-do-	Compound Manufacturer std.	Compound Manufacturer std.	Compound Manufacturer std.	-do-	1
BHEL										
PARTICULARS										
BIDDER/VENDOR										
NAME										
SIGNATURE										
DATE										
BIDDER/SVENDORS COMPANY SEAL										

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.

STANDARD QUALITY PLAN		CUSTOMER		PROJECT: 2X660 MW UDANGUDI SUPERCRITICAL STPP ST-I		SPECIFICATION NUMBER: PE-TS-435-507-E006A, R0				
SHEET 2 OF 10		BIDDER/VENDOR SYSTEM		QUALITY PLAN NUMBER: PE-QP-999-507-E006, R01		SPECIFICATION TITLE: EPR INSULATED FIRE SURVIVAL 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	10	11
1.3	Seathing Compound (Inner & Outer Sheath)	<p>GENERAL :</p> <ol style="list-style-type: none"> Physical properties Mech, properties <p>SPECIFIC CHECKS :</p> <ol style="list-style-type: none"> Make Type/ Grade Shelf life/ Storage condition 	MA	Physical Tests	Sample/ Batch	IS 16246 & Mfs Std./ Approved datasheet	IS 16246 & Mfs Std./ Approved datasheet	Inspection Report/ Test Cert.	2/3	1/2
			MA	Envir/Chemical	Sample/ Batch	IS 16246, ASTM D:2843, ASTM D:2863, IEC-60754-1/ Approved datasheet	IS 16246, ASTM D:2843, ASTM D:2863, IEC-60754-1/ Approved datasheet	Inspection 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 (Separator Tape)	<p>GENERAL :</p> <ol style="list-style-type: none"> Physical properties Elec, Properties 	MA	Physical Tests	Sample/ Batch	Mfr. Std./ Approved datasheet	Mfr. Std./ Approved datasheet	Inspection 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		SPECIFICATION				
SHEET 5 OF 10		CHARACTERISTIC CHECK		SYSTEM		ITEM - EPR INSULATED FIRE SURVIVAL CABLES		NUMBER :				
SL. COMPONENT/OPERATION NO.		CHARACTERISTIC CHECK		EXTENT OF CHECK		REFERENCE DOCUMENT		SECTION				
2		3		4		5		6				
2.5		Core Laying		MA		Measurement		7				
2.6		InnerSheath Extrusion		MA		Visual		8				
2.7		Armour		MA		Counting		9				
BHEL		PARTICULARS		BIDDER/VENDOR		FORMAT OF RECORD		10				
NAME		NAME		NAME		NAME		11				
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE		REMARKS				
DATE		DATE		DATE		DATE		AGENCY				
								P				
								W				
								V				
1		2		4		6		8		10		11
2.5	Core Laying	1. Dia over laid up core 2. Sequence of lay & direction 3. Lay Length	MA	Measurement Visual & Meas. Measurement	One Sample of each size/ lot -do- -do-	IS 16246 & Approved datasheet IS 16246 & Mfs Std. -do-	IS 16246 & Approved datasheet IS 16246 & Mfs Std. -do-	Inspection Report -do- -do-	2 2 2	- - -		
2.6	InnerSheath Extrusion	1. Surface finish 2. Thickness 3. Dia over inner sheath	MA	Visual Measurement -do-	100% One Sample of each size/ lot -do-	Surface shall be smooth IS 16246 & Appd. Datasheet -do-	Surface shall be smooth IS 16246 & Appd. Datasheet -do-	Inspection Report -do- -do-	2 2 2	- - -		(Pimple, fish eye, porosity & burnt particles not permitted.)
2.7	Armour	1. No. of wires/Strips 2. Lay length & Direction 3. Dia over armouring 4. Coverage	MA	Counting Visual & Meas. Measurement Measurement	At the start of the process -do- -do- -do-	IS 16246 & Appd. Datasheet -do- Appd. Datasheet -do-	IS 16246 & Appd. Datasheet -do- Appd. Datasheet -do-	Inspection Report -do- -do- -do-	2 2 2 2	- - - -		
BHEL		PARTICULARS		BIDDER/VENDOR		FORMAT OF RECORD		10		11		
NAME		NAME		NAME		NAME		NAME		REMARKS		
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE		AGENCY		
DATE		DATE		DATE		DATE		DATE		P		
										W		
										V		

BIDDER'S/VENDORS COMPANY SEAL



**TECHNICAL SPECIFICATION FOR
EPR INSULATED FIRE SURVIVAL CABLES**

Doc. No. PE-TS-435-507-E006A

2 X 660MW UDANGUDI STPP

Rev No. 00

DATE: 28.06.2022

ANNEXURE TO QAP

A. Type Test Conduction:

- a. Tests for which "T" is indicated in the 'Test Conduction Required As' column below shall be conducted as Type Test.
- b. Sampling:

Type tests shall be carried out on 1 drum selected on random basis, out of every 10 or less number of drums of each type and size of cable of each lot.

Size shall mean area of cross section in sq.mm read in conjunction with the number of cores.

Type shall mean type of insulation, sheath, volt grade FS etc.

- c. Fire Survival tests at sl.no. 8 to be conducted on all sizes / lot.

B. Acceptance Test Conduction:

- a. Tests for which "A" is indicated in the 'Test Conduction Required As' column below shall be conducted as Acceptance tests.
- b. Sampling:
Acceptance tests shall be carried out on 1 drum selected on random basis, out of every 10 or less number of drums of each type and size of cable of each lot.

Size shall mean area of cross section in sq.mm read in conjunction with the number of cores.

Type shall mean type of insulation, sheath, volt grade FS etc.

C. Routine Test Conduction:

- a. Tests for which "R" is indicated in the 'Test Conduction Required As' column below shall be conducted as Routine tests.
- b. Sampling:
Routine tests shall be conducted on 100% drums.

Note:

LOT shall be defined as per IS: 16246

<u>S. No.</u>	<u>TEST</u>	<u>APPLICABLE FOR</u>	<u>TEST CONDUCTION REQUIRED AS</u>	<u>REFERENCE STANDARD</u>	<u>REMARKS</u>
1.0	Tests for Conductor				
I.	Persulphate test	For tinned copper conductor only	T	IS 10810 Pt 4	
II.	Annealing test		T, A	IS 10810 Pt 1	<i>Internal in process Test Report to be furnished for acceptance test</i>
III.	Conductor Resistance test		T, A, R	IS 10810 Pt 5	
2.0	Tests for Armour Wires/Strips				

**TECHNICAL SPECIFICATION FOR
EPR INSULATED FIRE SURVIVAL CABLES****Doc. No. PE-TS-435-507-E006A****2 X 660MW UDANGUDI STPP****Rev No. 00****DATE: 28.06.2022****ANNEXURE TO QAP**

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
I.	Measurement of dimensions	Applicable for Aluminium wire & GS wire/Strip	T,A	IS 10810 Pt 36	
II.	Tensile test	Applicable for Aluminium wire & GS wire/Strip	T, A	IS 10810 Pt 37	
III.	Elongation at break test	Applicable for GS wire/Strip only	T, A	IS 10810 Pt 37	
IV.	Torsion test	For GS round wire only	T, A	IS 10810 Pt 38	
V.	Winding test	For GS strip only	T, A	IS 10810 Pt 39	
VI.	Resistivity test	Applicable for Aluminium wire & GS wire	T, A,R	IS 10810 Pt 42	
VII.	Uniformity of Zinc coating test	For G. S. wires/Strip only	T, A	IS 10810 Pt 40	
VIII.	Mass of Zinc coating test	For G. S. wires/Strip only	T, A	IS 10810 Pt 41	
IX.	Wrapping Test	For Aluminium wires only	T, A	IS 10810 Pt 3	
3.0	Test for Fire Barrier Tape				
I.	Test for minimum thickness	Fire barrier tape	T,A	IS 10810 Pt 6	
4.0	Physical Tests for EPR insulation & sheath				
I.	Material	Applicable for insulation, inner & outer sheath	T, A	IS 16246	
II.	Test for thickness	Applicable for insulation, inner & outer sheath	T,A	IS 10810 Pt 6	
III.	Tensile strength and elongation test at break	Applicable for insulation, inner & outer sheath	T,A	IS 10810 Pt 7	
IV.	Ageing in air oven	Applicable for insulation	T	IS 10810 Pt 11	
V.	Ageing in air bomb	Applicable for insulation, inner & outer sheath	T	IS 10810 Pt 56	
VI.	Hot set test	Applicable for insulation, inner & outer sheath	T,A	IS 10810 Pt 30	
5.0	Electrical Tests				
I.	Insulation resistance	Applicable for insulation	T,A	IS 10810 Pt 43	

**TECHNICAL SPECIFICATION FOR
EPR INSULATED FIRE SURVIVAL CABLES****Doc. No. PE-TS-435-507-E006A****2 X 660MW UDANGUDI STPP****Rev No. 00****DATE: 28.06.2022****ANNEXURE TO QAP**

S. No.	TEST	APPLICABLE FOR	TEST CONDUCTION REQUIRED AS	REFERENCE STANDARD	REMARKS
II.	High voltage (Water immersion) test	Applicable for insulation, inner & outer sheath	T,A,R	IS 10810 Pt 45	
III.	Water absorption test	Applicable for insulation	T	IS 10810 Pt 28	
6.0	<u>Tests on elastomeric inner & outer sheath</u>				
I.	Oxygen Index test		T, A	IS 10810 Pt 58/ ASTMD-2863	
II.	Temperature index test		T, A	IS 10810 Pt 64/ ASTMD-2863	
III.	Smoke density test		T, A	IS 10810 Pt 63/ ASTMD 2843	Smoke density in percent light absorption shall not exceed 20%
IV.	Acid Gas Generation test		T, A	IS 10810 Pt 59/ IEC 60754-1	Halogen acid content shall not be more than 2%
V.	Oil resistance		T	IS-16246	
7.0	<u>Flammability Tests</u>				
I.	Flame retardant test on bunched cables	For complete cable	T	IS-10810 Pt 62/ IEC-60332 (Part-3) CAT-B	
II.	Flame retardant test on single cable	For complete cable	T	IS 10810 Pt 61/ IEC:60332 Part-1	
8.0	<u>Circuit Integrity test</u>	For complete cable	T	IS-16246/ IEC 60331	Withstanding 750 degree C temperature for 3 hours
9.0	<u>Anti-rodent & Termite Repulsion Test</u>		A	--	
10.0	<u>Resistance to Water/UV Radiation/Fungus</u>	Declaration from Manufacture shall be submitted.			

ANNEXURE-A

BILL OF QUANTITIES (1.1kV EPR INSULATED FIRE SURVIVAL CABLES)

MAIN SUPPLY

1.1 kV Fire Survival cable with stranded, compacted, annealed copper conductor, EPR insulation, elastomeric Inner Sheath, AI Round Wire (applicable for single core cable) / GS Round Wire or GS Formed Wire Strip Armour (applicable for multi core cable) and elastomeric Outer Sheath Generally conforming to IS :16246 and BHEL specification.

S.No.	Item code	Item name	UOM	Ordered Quantity	Drum Length
A1	507-42008-A	3C - 1.5- ARMoured	MTR	1000	500
A2	507-42009-A	5C - 1.5- ARMoured	MTR	3000	500
A3	507-42018-A	2C - 25- ARMoured	MTR	500	500
A4	507-42019-A	2C - 50- ARMoured	MTR	2000	500
A5	507-42013-A	2C - 95- ARMoured	MTR	1000	500
A6	507-42015-A	3C - 50- ARMoured	MTR	1000	500
A7	507-42011-A	3C - 150- ARMoured	MTR	500	500
A8	507-42004-A	1C - 400- ARMoured	MTR	1000	500

NOTES :

- Quantities indicated above shall be known as Order Quantities. Quantity variation shall be as per NIT.
- The bidder shall indicate the unit price of each type and size of cables listed as per the BOQ-Cum-Price Schedule. The unit prices shall apply for adjustment of variation in quantity as stipulated above.
- Order quantities indicated above shall be cleared for manufacturing along with PO. However, manufacturing of the cables shall be taken up by the successful bidder only after approval of technical and quality documentation.
- The standard drum length shall be 500 meters as indicated above. Tolerance on individual drum length shall be $\pm 5\%$.
- Overall tolerance on total dispatched quantity of each size shall be (-) 2% and (+) 0% except where the total ordered quantity is one single drum length of 500m, in which case it shall be -5%/0%. Cables consumed for testing and inspection shall be to bidder's account.
- For each individual cable size, one short length of not less than 200m may be accepted only in the final drum length to complete the supply (except where the total ordered quantity is one single drum length of 500m). The overall tolerance limits stipulated above shall continue to apply (in case short lengths are accepted).
- In case of the quantities of any one lot cleared by BHEL for manufacturing are manufactured and offered for inspection by successful bidder in more than one batch, BHEL reserves the right to witness type testing on all batches without any price implications.
- Bidder shall indicate unit price of cables inclusive of type test charges. No separate charges shall be payable for type tests.



PRE-QUALIFYING REQUIREMENTS FOR
EPR INSULATED FIRE SURVIVAL CABLES

2 X 660MW UDANGUDI STPP

DOC. NO. PE-PQ-435-507-E018

REV. 00

DATE: 05/05/2022

SHEET 1 OF 1

ITEMS: EPR Insulated Fire survival cables

SCOPE:

Supply: YES

Erection & Commissioning: No

1	Vendor should be a manufacturer of LT Power & / or Control cable.
2	Availability of test reports of tests on LT EPR fire survival cables to establish in-house capability to carry out all routine, type & acceptance test as per relevant IS / International standards (except UV radiation, hydrolytic stability & Fire survival test) which can be conducted at Govt. Lab / Govt. approved independent lab.
3	Availability of type test certificate for LT-EPR fire survival cables for fire survival test conducted at independent lab or witnessed by third party as per relevant IS / International standards.
4	Capacity of manufacturing 200 km of power / control cables (including XLPE /PVC/EPR insulated , FS / non-FS cables) per month.
5	Manufactured and supplied LT power cable sizes of minimum 185 sq.mm for 3/3.5 core and minimum 400 sq.mm for single core cable.
6	Manufactured and supplied at least 5 km of LT EPR fire survival cables.
7	Minimum two (2) nos. purchase orders for Power & / or Control cables shall be submitted which should not be more than five (5) years old from date of techno commercial bid for establishing continuity in business.

Notes (General points):

1. Consideration of offer shall be subject to customer's approval of bidder's, if applicable.
2. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self- attested English translated document should also be submitted.
3. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
4. After satisfactory fulfilment of all the above criteria / requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

PREPARED BY

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5-5-22
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(DY. MGR.)

CHECKED BY

Ayan Saha
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SANDEEP LODH
(SR. DGM)

APPROVED BY

Debasisa Rath
5/5/22
DEBASISA RATH
(AGM- DH ELECTRICAL)

INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.



- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.



Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.



- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Noted

Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

Netral

For & On behalf of the Principal
(Office Seal)

नेत्रपाल सिंह / Netrapal Singh
Place: भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Sr. Engineer (PG-1)
Date: भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना अभियंत्रिकी प्रबंधन
Power Sector-Project Engineering Management
पोपीईईआई भवन, एच.आर.डी.आई. एण्ड ईएसआई कॉम्प्लेक्स
PPEI Bldg, H.R.D.I. & ESI Complex,
प्लॉट नं. 25, सेक्टर 16 ए, नोएडा -201301
Plot No. 25, Sec. 16 A, Noida - 201301

Witness: _____
(Name & Address) _____

For & On behalf of the Bidder/ Contractor
(Office Seal)

Witness: _____
(Name & Address) _____

Clause on IP in the tender**“Integrity Pact (IP)”**

- (a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

SI	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
 Name: _____
 Deptt: _____
 Address: _____
 Phone: (Landline/ Mobile) _____

 Email: _____
 Fax: _____

(2)
 Name: _____
 Deptt: _____
 Address: _____
 Phone: (Landline/ Mobile) _____

 Email: _____
 Fax: _____