

PRODUCT STANDARD
ELECTRICAL C & I
BAP/BHEL/RANIPET – 632 406

TECI: DADRIFGD: SCAB: REV 00
Page 1 of 9
EFFECTIVE DATE 12.07.2018

TITLE : TECHNICAL SPECIFICATION FOR BOUGHT OUT ITEMS FOR FGD
ITEM : SCREENED CABLE
PROJECT : DADRI (2X490MW) FGD
CUSTOMER : NATIONAL THERMAL POWER CORPORATION

NAME		DESIGNATION	SIGNATURE	DATE
PREPARED	G.RAVINDER	SR.ENGINEER	G. Ravinder	12.07.2018
CHECKED	M.JAYAMURUGANAND	AGM	M. Jayamuruganand	12.07.2018
APPROVED	M.JAYAMURUGANAND	AGM	M. Jayamuruganand	12.07.2018
ISSUED BY				
EDC – ECI				
REVISION NO :00		INITIAL RELEASE : 12.07.2018		

1.0.0 SCOPE :

1.1.0 The scope of supply of SCREENED CABLES includes design, manufacture, inspection, testing, packing and delivery.

2.0.0 APPLICATION:

2.1.0 The cable to be supplied under this specification is intended to use for DADRI FGD plant.

3.0.0 APPLICABLE STANDARDS:

3.1.0 The screened cable shall be manufactured, tested and packed as per the following standards (Latest issues and their amendments). In case of any conflict between these standards and this Technical specification, the later shall prevail to the extent of such difference. In case of any conflict between these standards, the most stringent condition shall prevail

- | | | | |
|--------|------------|---|--|
| 3.1.1 | IS 3961 | - | Recommended current ratings for cables. |
| 3.1.2 | IS 9938 | - | Recommended colours for PVC insulation for LF wires and cables. |
| 3.1.3 | IS 10418 | - | Specification for drums for electric cables. |
| 3.1.4 | IEEE 383 | - | Standard for type test of Class II electric cables, field splices & connections for Nuclear power generating stations. |
| 3.1.5 | ASTMD 2843 | - | Standard test method for density of smoke from the burning or decomposition of plastics |
| 3.1.6 | ASTMD 2863 | - | Standard test method for measuring the min. oxygen concentration to support candle like construction of plastics. |
| 3.1.7 | IEC 754 | - | Test on gases evolved during combustion of Electric cables (Part-I). |
| 3.1.8 | SS 4241475 | - | Flammability testing of cables. |
| 3.1.9 | VDE 0207 | - | Insulation and Sheathing compounds for cables and flexible cords. |
| 3.1.10 | VDE 0472 | - | Rules for testing insulated cables and flexible cords. |
| 3.1.11 | VDE 0815 | - | Wiring cables for telecommunication and data processing system. |

- 3.1.13 IS 1554 (Part-1) PVC insulated (heavy duty) electric cables for working voltage upto and including 1100V.
- 3.1.14 IS 10810 Method of tests for cables.
- 3.1.15 IEC 332 (Part-3 category-B) Test on electric cables under fire conditions.

4.0.0 SITE ENVIRONMENT:

- 4.1.0 Ambient Temperature : 5 deg.C to 50 deg.C.
- 4.1.1 Design Ambient Temperature : 50 deg.C.
- 4.1.2 Relative Humidity : 100 %.

5.0.0 CONSTRUCTION OF SCREENED CABLE:

The conductors shall be formed by multi strands. Such multi strand conductors shall be insulated with PVC. Two such cores shall be twisted with 50mm (MAX) lay, and shall be MELINEX tapped with of thickness 0.028mm (min.) with 100% cover age and min.20% (min) overlap. Such taped pair shall be 100% screened with 20% (min) overlap using 0.06mm thick Aluminium Mylar tape. A drain wire of size 0.5 sq.mm. Annealed Tinned copper conductor formed by 7 strands, shall be provided for individual pair screen touching aluminium and overall shield. Then a POLYSTER TAPE of thickness 0.028mm (min.) shall be provided on such screened pair with 100% coverage and 20% (min.) overlap for screen isolation. Single layer of numbered binder tape on each pair shall be provided. Unit formation of four pairs with printing of no. of unit shall be provided. Conductor / pair identification as per VDE0815 shall be provided.

Such screened pairs shall be laid up, collectively 100% screened with 20%(min) overlap using 0.06mm thick ALUMINIUM MYLAR TAPE. Then a drain wire of 0.5 sq.mm Annealed Tinned Copper conductor formed by 7 strands shall be provided touching aluminium. Individual pair shielding shall be provided for F-type cable with a minimum thicknes of 28 micron. Overall cable assembly shielding shall be provided with a minimum thickness of 55 micron.

Such laid-up cables shall be provided with FRLS-PVC outer sheath.

6.0.0 SPECIFICATION OF SCREENED CABLE:

6.1.0 Common Requirements

Sl. No.	Property	Requirement
1	Voltage grade	225 V (peak value)
2	Codes and standard	All instrumentation cables shall comply with VDE 0815, VDE 0207, Part 4, Part 5, Part 6, VDE 0816,VDE 0472, SEN 4241475, ANSI MC 96.1, IEC 60584,IS-8784, IS-10810 (latest editions) and their amendments read along with

		this specification.
3	Continuous operation suitability	At 205 Deg For Type-C cables & Heat resistant cables, At 70 deg.C for all types of cables
4	Marking :- a.Progressive automatic on-line sequential marking of length in meters to be provided at every one meter on outer sheath. b.Marking to read 'FRLS' to be provided at every 5 meters on outer sheath except for Type-C cable c.Durable marking at intervals not exceeding 625 mm shall include manufacturer's name, insulation material, conductor's size, number of pairs, voltage rating, type of cable, year of manufacturer to be provided on outer sheath.	
5	Progressive automatic on-line sequential marking of length in meters	To be provided at every one meter on outer sheath.
6	Marking to read FRLS	To be provided at every 5 meters on outer sheath except for Type-C cable.
7	Allowable Tolerance on overall diameter	+/-2 mm (maximum) over the declared value in data sheet
8	Variation in diameter	Not more than 1.0mm throughout the length of cable.
9	Ovality at any cross-section	Not more than 1.0 mm
10	Color	The outer sheath shall be of blue color except for KX & SX extension cables. For KX & SX extension cables color of outer sheath shall be as per ANSI MC 96.1/ IEC 60584.
11	Others	a) Durable marking at intervals not exceeding 625mm shall include manufacturers name, insulation material, conductor's size, number of pairs, voltage rating, type of cable, year of manufacture to be provided. b) Cables shall be suitable for laying in conduits, ducts, trenches, racks and underground-buried installation c) Repaired cables shall not be acceptable.

6.2.0 Specific Requirements

Specification Requirements	Type-A cable	Type-B cable	Type F & G cable	
A. Conductors				
Cross Section area	0.5 sq.mm			
Conductor material	Type KX as per ANSI MC 96.1/ IEC 60584	Type SX as per ANSI MC 96.1/ IEC 60584	Annealed bare copper	

Colour code	Type KX as per ANSI MC 96.1/ IEC 60584	Type SX as per ANSI MC 96.1/ IEC 60584	As per VDE-815	
Conductor Grade	As per ANSI MC 96.1 / IEC 60584		Electrolytic	
No & dia of strands	7 x 0.3 mm (nom)			
No. of Pairs	2	2	2,4,8,12,16,24,48	
Max. Conductor loop resistance per Km (in ohm) at 20 deg.C	As per ANSI MC 96.1		73.4 (loop)	
Reference Standard	As per ANSI MC 96.1/ IEC 60584		VDE 0815	
B. Insulation				
Material	Extruded PVC type YI 3			
Thickness in mm (Min/Max)	0.25/0.35			
Volume Resistivity (Min) in ohm-cm	1 x 10 ¹⁴ at 20 deg.C & 1 x 10 ¹¹ at 70 deg.C			
Voltage Rating	225 V peak operating voltage			
Reference Standard	VDE 0207 Part 4			
Core diameter above insulation	Suitable for cage clamp connector			
C. Pairing and Twisting				
Max. Lay of pairs (mm)	50			
Single layer of Numbered binder tape on each pair provided	Yes			
Unit formation of four pairs with printing of no. of Unit provided	N.A.		Yes	
Conductor / pair identification as per VDE0815	N.A.		To be provided (colour coding attached).	
D. Shielding				
Type of shielding	Al-Mylar tape			
Individual pair shielding	No		To be provided for F-type cable	
Minimum thickness of Individual pair shielding	No		28 micron	
Overall cable assembly shielding	To be provided			
Minimum thickness of Overall cable assembly shielding	55 micron			
Shielding coverage	100% with atleast 20% overlap			

Drain wire provided for individual shield	N.A.	Yes (for F-t ype) Si ze - 0 . 5 sqmm No of st r a n d s - 7 Dia of strands- 0.3mm Annealed Tin coated copper	
Drain wire provided for overall shield	Yes, Size- 0.5 sqmm,No of strands-7,Dia of strands- 0.3mm,Annealed Tin coated copper		
E. FILLERS			
Non-hygroscopic, flame retardant	To be provided		
F. Outer Sheath			
Material	Extruded PVC compound YM1 with FRLS properties		
Minimum Thickness at any point	1.8 mm		
Nominal Thickness at any point	>1.8 mm		
Color	Blue		
Resistant to water, fungus, termite & rodent attack	Required		
Min Oxygen index as per ASTM D-2863	29%		
Min Temperature index as per ASTM D-2863	250 deg.C		
Acid gas generation by weight as IEC-60754-1	Maximum 20%		
Smoke Density Rating as per ASTM D-2843	Maximum 60% (defined as the average area under the curve when the results of smoke density test plotted on a curve indicating light absorption vs. Time as per ASTM D-2843)		
Reference standard	VDE207 Part 5,VDE-816		
G. Electrical parameters			
Mutual capacitance between Conductors at 0.8 KHz (Max.)	200 nF/km	120nF/km for F type 100 nF/km for G-type	
Insulation Resistance (Min.)	100 M Ohm/Km		
Cross Talk Figure (Min.) at 0.8 KHz	60 dB	60 dB	
Characteristic	N.A.	320 Ohm for F-	

Impedence (Max) at 1 Khz		type 340 ohm for G-type	
Attenuation Figure at 1 Khz (Max)	N.A.	1.2 db/km	
H. Complete Cable			
Complete cable assembly	Shall pass Swedish Chimney test as per SEN-SS 4241475 class F3.		
Flammability	Shall pass flammability as per IEEE-383 read in conjunction to this specification.		
I. Cable drum			
Type	Non-returnable wooden drum (wooden drum to be constructed from seasoned wod free from defects with wood preservative applied to the entire drum) or steel drum.		
Outermost layer covered with waterproof paper	Yes		
Painting	Entire surface to be painted		
Length	1000 m +/- 5% for upto & including 12 pairs 500m +/- 5% for above 12 pairs		

7.0.0 GENERAL REQUIREMENTS:

- 7.1.0 The cable shall be designed to withstand all mechanical, electrical and thermal stresses under steady state and transient operation conditions. The cable shall be suitable for laying in wet & dry locations in trays, conduits, ducts, trenches etc.
- 7.1.1 The cable shall be designed for a steady state continuous conductor temperature of 70 deg.C.
- 7.1.2 The cable shall comply with latest edition of VDE 0815, VDE 0207 part 4 & 5 & 6 VDE 0816, VDE 0472 standards including the amendments, read along with this specification. However the voltage grade of the cable shall be 225V peak operating voltage.
- 7.1.3 Allowable tolerance on overall diameter of the cable shall be +/- 2 mm (max.) over the declared value in the technical data sheet . The variation in diameter & the ovality at any cross section shall not be more than 1.0 mm.
- 7.1.4 The cable shall be capable of withstanding a conductor temperature of 160°C during a short circuit.
- 7.1.5 The nominal current rating of all PVC insulated cables shall be as per IS 3961.
- 7.1.6 Repaired cables shall not be offered and the same will not be accepted.
- 7.1.7 Progressive automatic on line sequential marking of the length of cable in metres at every one metre shall be provided on the outer sheath of all cables.

- 7.1.7 Progressive markings to read "FRLS" at every 5 metres shall be provided on the outer sheath of all cables.
- 7.1.8 The cable shall be supplied in Non-returnable drum in coil form of min. length of 1000 meters $\pm 5\%$.
- 7.1.9 The cable shall be provided with markings including manufacturer's name, insulation material, conductor size, number of pairs, voltage rating, type of cable, year of manufacture at intervals not exceeding 625mm.
- 7.1.10 The pairs of cable shall be identified by colour coding. The colour coding and cable identification shall be as per VDE 0815.
- 7.1.11 Non – hygroscopic PVC/ POLYTHELENE sheet shall be provided on the surface of the barrel of the drum & over outermost layer of the cable.
- 7.1.12 Cable accessories such as harnessing components, markers, bedding, binding tape etc. shall also have flame retardant quality.
- 7.1.13 The dielectric strength shall be as follows :

Conductor to conductor	3KV for 5 min.
Conductor to screen	0.5KV for 5 min.

8.0.0 PACKING AND MARKING:

- 8.1.0 The cable shall be wound on a non-returnable drum in length of 1000 metres $\pm 5\%$ and packed. The packing shall be suitable for keeping it in outside which shall withstand heavy rain & dusty environment. The remaining length shall be supplied in a single drum. Cut bits or not acceptable. Over all quantity tolerance against each size shall be +0%, -2%.
- 8.1.1 The drum shall be provided as per IS 10418.
- 8.1.2 The ends of the cable shall be sealed by means of non-hygroscopic sealing material.
- 8.1.3 The information as detailed in Clause 18.2 of IS 1554 (Part-I) shall be stencilled on each drum.

9.0.0 DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT:

The data sheet shall be submitted in SOFT MEDIA for approval, within 10 days from the date of order.

10.0.0 INSPECTION AND TESTING:

10.1.0 The cable shall be inspected and tested based on the following documents.

1. NTPC Approved Quality Plan (QP) refereed in the Enquiry / P.O.
2. BHEL Technical Specification (TEP).
3. BHEL Purchase order.
4. BHEL approved suppliers data sheet.

11.0.0 This specification meets NTPC contract specification. Hence no deviation shall be taken by the supplier.

PROJECT: NTPC-NCTPP DADRI-II (4X490MW) FGD PACKAGE CONTRACTOR: BHEL - RANIPET CONTRACT NO: .: CS-6130-109-9		CONTRACT QUALITY REQUIREMENTS (CQR) for SCREENED CABLE NTPC-NCTPP DADRI-II (4X490MW) FGD PACKAGE (BHEL CUST No: G501& G502)	DOC.NO: BAP/QR/G501&G502 /SC:010 Rev NO. : 00 PAGE : Page 1 of 2 DATE: 17 05 2018	##Enquiry No: ##Supplier Name: ##Offer reference: ##Date:
Sl. NO.	DESCRIPTION	BHEL/NTPC Requirements		##Specific confirmations by the vendor

ITEM: SCREENED CABLE

01	Type Test Requirements	1. Vendor shall submit the type test reports of all the type tests as listed in SL NO: 4 and carried out with in 10 years from the data of NTPC bid opening dt: 19 12 2017. These reports should be for the test conducted on the similar equipment to those proposed to be supplied under this enquiry and test(s) should have been either conducted at an independent laboratory (or) should have been witnessed by TPI/BHEL/NTPC. 2. However if vendor is not able to submit the similar type test report as per above condition (or) in the case of type test reports are not found to be meeting the specification requirement, the vendor shall conduct all the tests at no additional cost to BHEL either at third party lab (or) own lab in the presence of TPI/BHEL/NTPC and submit the reports for approval 3. Type Test reports review and approval by NTPC is a must 4. Type following type certificate shall be submitted. <u>CONDUCTOR</u> ✓ Resistance test : For Cu (VDE-0815) ✓ Diameter Test (IS-10810) ✓ Tin Coating Test (Drain wire) (IS-10810) <u>ARMOUR WIRES/FORMED WIRES</u> (If it is applicable) ✓ Measurement of dimensions ✓ Tensile test ✓ Elongation test ✓ Torsion test : For round wire only ✓ Winding test: For formed wires only ✓ Resistance Test ✓ Zinc coating test: For GS formed wires/wires only. ✓ Wrapping test for aluminum wires only. <u>INSULATION</u> ✓ Loss of mass (VDE-0472) ✓ Aging in air ovens (VDE-0472) ✓ Tensile strength and elongation(VDE-0472) ✓ Heat Shock(VDE-0472) ✓ Hot deformation(VDE-0472) ✓ Shrinkage (VDE-0472) ✓ Bleeding and Blooming (IS-10810) <u>Inner Sheath</u> ✓ Loss of Mass (VDE-0472) ✓ Heat Shock (VDE-0472) ✓ Cold bend / Cold Impact (VDE-0472) ✓ Hot deformation(VDE-0472) ✓ Shrinkage(VDE-0472) <u>Outer Sheath</u> ✓ Loss of Mass (VDE-0472) ✓ Aging in air oven (VDE-0472) ✓ Tensile strength and elongation test before and after aging(VDE-0472) ✓ Heat shock test (VDE-0472) ✓ Hot Deformation(VDE-0472) ✓ Shrinkage(VDE-0472) ✓ Bleeding and blooming(IS-10810) ✓ Colour fastness to water (IS-5831) ✓ Cold bend / cold Impact test (VDE-0472) ✓ Oxygen Index test (ASTMD-2863) ✓ Smoke Density Test (ASTMD-2863) ✓ Acid Gas generation test(IEC-754-1)	
----	-------------------------------	--	--

PROJECT: NTPC-NCTPP DADRI-II (4X490MW) FGD PACKAGE CONTRACTOR: BHEL - RANIPET CONTRACT NO: .: CS-6130-109-9		CONTRACT QUALITY REQUIREMENTS (CQR) for <u>SCREENED CABLE</u> NTPC-NCTPP DADRI-II (4X490MW) FGD PACKAGE (BHEL CUST No: G501& G502)	DOC.NO: BAP/QR/G501&G502 /SC:010 Rev NO. : 00 PAGE : Page 2 of 2 DATE: 17 05 2018	##Enquiry No: ##Supplier Name: ##Offer reference: ##Date:
Sl. NO.	DESCRIPTION	BHEL/NTPC Requirements		##Specific confirmations by the vendor
ITEM: SCREENED CABLE				
		<u>Fillers</u> ✓ Oxygen Index test (ASTMD-2863) ✓ Acid Gas generation test(IEC-754-1) <u>AL-Mylar Shield</u> ✓ Continuity test ✓ Shield Thickness ✓ Overlap Test <u>Over all cables</u> ✓ Flammability Test as per IEEE 383 ✓ Swedish Chimney test ✓ Noise Interference ✓ Dimensional checks(IS-10810) ✓ Cross talk (VDE-0472) ✓ Mutual capacitance (VDE-0472) ✓ HV test ((VDE-0472) ✓ Drain Wire Continuity		
		5. The TCs/Test reports shall also be given as PDF file with index sheet & page control thro Email & CD (File size to less than 9MB).(.)		
02	Quality Plan Requirement	1. NTPC SQP ref: QP No:-0000-999-QOI-S-035 Rev:00 Dt 05/09/2012 is applicable for Screened Cable. 2. The applicable NTPC SQPs for Screened cables are attached. 3. Vendor shall submit the filled up Endorsement sheet for above NTPC approved SQPs separately for control cable and power cable with signature & seal along with this offer (typical copy attached). 4.		
		5. Specific confirmation for Document Package in the event of an order (2 hard copies + 2 CDs in Pdf file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) QP/RQP/Endorsement sheet (iii) TCs identified by BHEL/NTPC for record for “CHP” and Verification portion as given in RQP/QP. (iv) Final Inspection Report + TC (v) BHEL/BHEL authorized Inspection Agency report + TC (vi) NTPC CHP/MDCC (vii) Type test reports conducted/submitted with approval		

Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise the offer may not be considered w.r.t
Quality Requirements being customer specific requirements.

		ITEM : Instrumentation Cables. SUB SYSTEM : Shielded Instrument/ TC extension/ Compensating PVC FRLS Cable		STANDARD QUALITY PLAN				To be filled by NTPC QP No.: 0000-999-QOI-S-035 Revision:00 Date:05/09/2012 Page:1 OF 5		Reviewed By: Archana Nath Rajeev Garg S.samanta	Approved By:  A.K.GARG Dt.....		
								Valid up to : 04/09/2015					
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check		Reference Document	Acceptance Norms	Format of record	Agency			Remarks
1	2	3	4	5	6		7	8	9	D*	10		11
I. RAW MATERIAL													
A CONDUCTOR													
A1	COPPER ROD For Conductor/ Drain wire	a) Dimension	Maj.	Measu.	1 sample/lot	—	IS:613/IS:12444	IS:613/IS:12444	IMR/ TC	V	-	-	Make - As per Annexure enclosed
		b) Conductivity/ Resistivity	Cri.	Elec.	1 sample/lot	1 sample/lot	IS:613/IS:12444	IS:613/IS:12444	IMR/ TC	V	V	-	
A2	Conductor for compensating cable	a) Size	Min	Dimen	1 Sample / lot	—	APPROVED DATASHEET	APPROVED DATA SHEET	IMR/ TC	P	-	-	Make - As per Annexure enclosed
		b) Resistance check	Maj	Elec	1 Sample / lot	—	APPROVED DATASHEET	APPROVED DATA SHEET	IMR/ TC	P	-	-	
		c) Thermo emf	Cri	Elec	1 Sample / lot	—	ANSI MC 96.1	ANSI MC 96.1	IMR/ TC	P	-	-	
		d) Specific resistance, Temp. coefficient	Maj	Elec/Me ch	1 Sample / lot	1 Sample / lot	Mfr. catalog	Mfr. catalog	IMR/ TC	V	V	V	
		e) Chemical composition.	Maj	Chem.	1 Sample / lot	1 Sample / lot	Mfr. catalog	Mfr. catalog	IMR/ TC	V	V	V	
B PVC COMPOUND													
B1	PVC Compound (Insulation & Sheath) Type of compound as per NTPC Spec.	a) Thermal stability (for Insulation)	Maj.	Therm.	1 sample/lot	1 sample/lot	VDE 207 Part -4/5	VDE 207 Part -4/5	IMR/ TC	P	V	-	
		b) TS & % Elongation Before and After aging and variation.	Maj.	Mech.	1 sample/lot	1 sample/lot	VDE 207 Part -4/5	VDE 207 Part -4/5	IMR/ TC	P	V	-	
		c) Loss of Mass (Sheath)	Maj.	Therm.	1 sample/lot	1 sample/lot	VDE 207 Part -4/5	VDE 207 Part -4/5	IMR/ TC	P	V	-	
B2	FR Properties for Filler Compound	a) Oxygen index	Cri.	Chem	1 sample/lot	1 sample/lot	29 %(min)ASTMD2863	29%(min)ASTMD2863	IMR/ TC	P	V	-	
		b) Temperature index deg. C	Cri.	Chem	1 sample/lot	1 sample/lot	250 deg. C(min) ASTMD2863	250 deg. C(min) ASTMD2863	IMR/ TC	P	V	-	
B3	FRLS Properties for Sheath	a) Oxygen index	Cri.	Chem	1 sample/lot	1 sample/lot	ASTMD2863/ APPROVED DATASHEET	ASTMD2863/ APPROVED DATASHEET	IMR/ TC	P	V	-	
		b) Temperature index	Cri.	Chem	1 sample/lot	1 sample/lot	ASTMD2863/ APPROVED DATASHEET	ASTMD2863/ APPROVED DATASHEET	IMR/ TC	P	V	-	
		c) Smoke density rating	Cri.	Chem	1 sample/lot	1 sample/lot	ASTMD2843/ APPROVED DATASHEET	ASTMD2843/ APPROVED DATASHEET	IMR/ TC	P	V	-	
		d) HCL Emission	Cri.	Chem	1 sample/lot	1 sample/lot	IEC754-1/ APPROVED DATASHEET	IEC754-1/ APPROVED DATASHEET	IMR/ TC	P	V	-	
C	Tapes / Binders (Aluminium Mylar,Melinex & Binders)	a) Thickness	Maj.	Mesu.	1 Sample/ Lot	1 Sample/ Lot	APPROVED DATASHEET	APPROVED DATASHEET	IMR/ TC	P	V	-	
		b) Size	Maj.	Mesu.	1 Sample/ Lot	1 Sample/ Lot	APPROVED DATASHEET	APPROVED DATASHEET	IMR/ TC	P	V	-	
D	Armour (If applicable)	a) Dimension	Maj.	Mesu.	1 Sample/ Lot	1 Sample/ Lot	APPROVED DATASHEET	APPROVED DATASHEET	IMR/ TC	P	V	-	
		b) TS & %Elongation	Maj.	Mech	1 Sample/ Lot	1 Sample/ Lot	IS 3975	IS 3975	IMR/ TC	P	V	-	
		c) Zn Coating	Maj.	Chem	1 Sample/ Lot	1 Sample/ Lot	IS 3975	IS 3975	IMR/ TC	P	V	-	
		d) Resistivity	Maj.	Elect	1 Sample/ Lot	1 Sample/ Lot	IS 3975	IS 3975	IMR/ TC	P	V	-	
LEGEND : * RECORDS, IDENTIFIED WITH " TICK" SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION .M:MANUFACTURER/ SUB SUPPLIER C:MAIN SUPPLIER,N:NTPC, P:PERFORM ,W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W"													
Format No. :QS-01-QAI-P-09/F1-R1													

		ITEM : Instrumentation Cables. SUB SYSTEM : Shielded Instrument/ TC extension/ Compensating PVC FRLS Cable	STANDARD QUALITY PLAN				To be filled by NTPC QP No.: 0000-999-QOI-S-035 Revision:00 Date:05/09/2012 Page:2 OF 5		Reviewed By: Archana Nath Rajeev Garg S.samanta		Approved By A.K.GARG Dt.....	
							Valid up to : 04/09/2015					
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check	Reference Document	Acceptance Norms	Format of record	Agency	Remarks		
1	2	3	4	5	6	7	8	9	D*	10	11	
E	Wooden Drums	a) Constructional checks	Maj.	Visu.	100%	IS 10418	IS 10418	IMR/ TC		P	-	-
		b) Dimensions	Maj.	Mesu.	1 Sample/ Lot	IS 10418	IS 10418	IMR/ TC		P	-	-
II INPROCESS INSPECTION												
A	Wire Drawing & Annealing	a)Size	Maj.	Dimn.	1 Sample at Start and 1 Sample at End	Approved Datasheet	Approved Datasheet	IMR/ TC		P	-	-
		b) Surface finish	Maj.	Visu.	100%	Surface shall be smooth	Surface shall be smooth	IMR/ TC		P	-	-
		c) % of Elongation	Maj.	Mech.	1 Sample/ Lot	IS:8130	IS:8130	IMR/ TC		P	-	-
B	Tinning (Only for Drain wire)	a) Size	Maj.	Dimn.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-
		b) Percentage of Elongation	Maj.	Mech.	1 Sample/ Lot	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC	P	V	V
C	Bunching	a) Dimension and No. of strand.	Maj.	Measu.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P		
		b)Resistance	Cri	Elec.	1 Sample/ Lot	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC	P	V	V
D	Insulation	a) Surface finish	Maj.	Visu.	100%	Surface shall be smooth & free from scratches	Surface shall be smooth & free from scratches	IMR/ TC		P	-	-
		b) Core Diameter	Maj.	Measu.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-
		c) Radial Thickness(Min & Max.)	Maj.	Measu.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-
		d) Spark Test	Maj.	Elec.	100%	100%	IS 10810(With 3KV ac)	No Spark failure is allowed	IMR/ TC	P	V	V
		e) Volume Resistivity/ Insulation Resistance	Maj.	Elec.	1 Sample/ Lot	1 Sample/ Lot	VDE -0207/ Approved Datasheet	VDE -0207/ Approved Datasheet	IMR/ TC	P	V	V
		f) Colour, Marking/ Identification	Maj.	Visual	100%	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC	P	V	-
		g) TS & %Elongation	Maj.	Mech.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	VDE -0207/ Approved Datasheet	IMR/ TC		P	-	-
E	Twisting	a) Lay length and Direction	Maj.	Measu. &	1 Sample at Start and 1 Sample at End	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-
		b) Size/ Dimension	Maj.	Measu.	1 Sample/ Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-
		c) Pair Colour	Maj.	Visual	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-

LEGEND : * RECORDS, IDENTIFIED WITH " TICK" SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION .M:MANUFACTURER/ SUB SUPPLIER C:MAIN SUPPLIER,N:NTPC, P:PERFORM ,W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W"

Format No. :QS-01-QAI-P-09/F1-R1

		ITEM : Instrumentation Cables. SUB SYSTEM : Shielded Instrument/ TC extension/ Compensating PVC FRLS Cable	STANDARD QUALITY PLAN					To be filled by NTPC		Reviewed By:		Approved By:		
								QP No.: 0000-999-QOI-S-035 Revision:00 Date:05/09/2012 Page:3 OF 5		Archana Nath Rajeev Garg S.samanta		अनुमोदित A.K.GARG Approved		
							Valid up to : 04/09/2015							
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check		Reference Document	Acceptance Norms	Format of record	Agency			Remarks	
1	2	3	4	5	M	C,N	7	8	9	D*	10	11		
F	Laying of Pairs/ Taping/ Shielding (Wherever Applicable)	a) Construction	Maj.	Visu.	100%	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		b) Dimension	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		c) Coverage/ Overlap	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		d) Continuity	Maj.	Dimn.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
G	Sheathing (Inner - If applicable)	a) Surface Finish	Maj.	Visual	100%	—	Smooth, free from visual defects #	Smooth, free from visual defects#	IMR/ TC		-	-	# Porosity, Burnt particles, Pimples (Repairs are not allowed)	
		b) Colour	Maj.	Visual	100%	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-		-
		c) Diameter / Thickness	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-		-
H	Armouring (If applicable)	a) Surface finish	Maj.	Visual	100%	—	Smooth, free from visual defects like rusting etc.	Smooth, free from visual defects like rusting etc.	IMR/ TC		P	-	-	
		b) Direction of Lay & Coverage	Maj.	Visual	100%	—	Smooth, free from visual defects like rusting etc.	Smooth, free from visual defects like rusting etc.	IMR/ TC		P	-	-	
		c) Size of Wire/ Strip	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		d) Diameter over Armouring	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
I	Sheathing (Outer)	a) Surface Finish	Maj.	Visual	100%	—	Smooth, free from visual defects#	Smooth, free from visual defects#	IMR/ TC		P	-	-	
		b) Colour/ Marking/ Embossing	Maj.	Visual	100%	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		c) Overall Diameter, Thickness	Maj.	Measu.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
		d) TS & %Elongation	Maj.	Mech.	1 Sample/ Lot	—	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	IMR/ TC		P	-	-	
III. FINAL INSPECTION														
A.	TYPE TEST	Type test as per agreement with NTPC Engg. Review of type test clearance from NTPC Engg. before final Inspection - CHP												
B.	ROUTINE TEST	a) Cond.resistance (Cable & Drain wire)	Cri.	Elec.	100%	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	V	V	
		b) HV Test	Cri.	Elec.	100%	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	V	V	
LEGEND : * RECORDS, IDENTIFIED WITH " TICK" SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION .M:MANUFACTURER/ SUB SUPPLIER C:MAIN SUPPLIER,N:NTPC, P:PERFORM ,W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W"														
Format No. : QS-01-QAI-P-09/F1-R1														

		ITEM : Instrumentation Cables. SUB SYSTEM : Shielded Instrument/ TC extension/ Compensating PVC FRLS Cable	STANDARD QUALITY PLAN				To be filled by NTPC QP No.: 0000-999-QOI-S-035 Revision:00 Date:05/09/2012 Page:4 OF 5				Reviewed By: Archana Nath Rajeev Garg S.samanta		Approved By अनुमोदित Approved A.K.GARG	
							Valid up to : 04/09/2015							
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check		Reference Document	Acceptance Norms	Format of record	Agency			Remarks	
1	2	3	4	5	M	C,N	7	8	9	D*	10	11		
		c) IR Test (on drum length)	Cri.	Elec.	100%	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	V	V	
		d) Drain wire continuity	Cri.	Elec.	100%	100%	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	V	V	
C.	ACCEPTANCE TEST	a) Cond.resistance (Cable & Drain wire)	Cri.	Elec.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		b) HV Test	Cri.	Elec.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		c) IR Test	Cri.	Elec.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		d) Constructional Details & Dimensions												
		i) Constructional Details	Maj.	Visual	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		ii) Shield Al-mylar thickness	Maj.	Measu.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		iii) Insulation thickness	Maj.	Measu.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		iv) Inner/ Outer sheath thickness (as applicable)	Maj.	Measu.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		v) Diameter over outer sheath	Maj.	Measu.	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		e) Outer sheath - Colour, Marking/ Embossing & End sealing.	Maj.	Visual	Samples as per IS 1554/8784	Samples as per IS 1554/8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		f) Length checking.	Maj.	Measu.	1 No. of each size & type per Lot	1 No. of each size & type per Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		g) Core - Band marking/ Numbering, Colour.	Maj.	Visual	1 No. of each size & type per Lot	1 No. of each size & type per Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	
		h) Overall Coverage/overlap of shield & Continuity of drain wire.	Maj.	Visual	1 No. of each size & type per Lot	1 No. of each size & type per Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	

before and after ageing for insulation.

Continuity shall be checked as per Manufacturer practice.

LEGEND : * RECORDS, IDENTIFIED WITH " TICK" SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION .M:MANUFACTURER/ SUB SUPPLIER C:MAIN SUPPLIER, N:NTPC, P:PERFORM ,W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W"

Format No. :QS-01-QAI-P-09/F1-R1

		ITEM : Instrumentation Cables. SUB SYSTEM : Shielded Instrument/ TC extension/ Compensating PVC FRLS Cable		STANDARD QUALITY PLAN				To be filled by NTPC QP No.: 0000-999-QOI-S-035 Revision:00 Date:05/09/2012 Page:5 OF 5				Reviewed By: Archana Nath Rajeev Garg S.samanta		Approved By A.K.GARG Dt.....	
								Valid up to : 04/09/2015							
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check		Reference Document	Acceptance Norms	Format of record	Agency			Remarks		
1	2	3	4	5	M	C,N	7	8	9	D*	10		11		
		i) Thermal EMF test (For compensating cable only)	Maj.	Elec.	Sample as per IS 8784	Sample as per IS 8784	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
		j) Thermal Stability (Insulation & Sheath)	Maj.	Chem.	1 No. of each size & type per Lot	1 No. of each size & type per Lot	Spec./ADS/IS:5831	Spec./ADS/IS:5831	FIR	✓	P	W	W		
		k) Visual & Surface Finish	Maj.	Visual	1 No. of each size & type per Lot	1 No. of each size & type per Lot	Smooth, free from visual defects #	Smooth, free from visual defects #	FIR	✓	P	W	W	# Like Porosity, Burnt particles, Pimples	
		l) Electrical Parameters (Mutual capacitance, Cross talk, Attenuation, Characteristic Impedence as applicable)	Maj.	Elec.	1 No. of each size & type per Lot	1 No. of each size & type per Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
		m) Persulphate Test (For Drain wire)	Maj.	Chem.	1 No. of each size & type per Lot	1 No. of each size & type per Lot	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
		n) Swidesh chimney test (overall cable)	Maj.	Chem	1 No./ Complete lot offered \$	1 No./ Complete lot offered \$	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W	\$ Irrespective of size & type.	
		o) FRLS Test for outer sheath for OI(Oxygen Index), TI(Temperature Index), SDR(Smoke Density Rating) & HCL Emission.	Maj.	Chem	1 No./ Complete lot offered \$	1 No./ Complete lot offered \$	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
		p) TS & %Elongation test of Insualtion & Sheath (Before & After aging)	Maj.	Mech	1 No./ Complete lot offered \$	1 No./ Complete lot offered \$	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
		q) Volume Resistivity (At room and Elevated Temperature)	Maj.	Elec.	1 No./ Complete lot offered \$	1 No./ Complete lot offered \$	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W		
	r) Armouring Dimension & Zn coating. (If applicable)	Maj.	Measu.	1 No./ Complete lot offered \$	1 No./ Complete lot offered \$	NTPC Tech.Specification /Approved Datasheet	NTPC Tech.Specification /Approved Datasheet	FIR	✓	P	W	W			
D.	Packaing and Dispatch	Stencileing, completeness & Verification with packing list	Maj.	Visual.	100%	-	Mfg. Practice	Mfg. Practice			P	-	-		
NOTE 1 : Where witnessing and verification of records is done only by main contractor (Coloum "C"), NTPC inspection Engineer may do a survillence Verification/ Witnessing as per his discretion.															
NOTE 2 : IMR : Inword Material Register, TC : Test Certificates, Mfg. : Manufacturer, FIR : Final Inspection Report.															
NOTE 3: NTPC Inspection Enginner to check,approval date,revision no of reference documents at the time of Inspection.															
LEGEND : * RECORDS, IDENTIFIED WITH " TICK" SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION .M:MANUFACTURER/ SUB SUPPLIER C:MAIN SUPPLIER,N:NTPC, P:PERFORM ,W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W"															
Format No. :QS-01-QAI-P-09/F1-R1															

ACCEPTABLE MAKES

COPPER ROD

M/S HCL
M/S STERLITE
M/S BIRLA COPPER
M/S INDO GULF
M/S LG INTERNATIONAL

IMPORTED VENDORS (LONDON METAL EXCHANGE REGISTERED VENDORS ONLY)

THERMOCOUPLE WIRES

ISABELLA HAUTE-GERMANY
SANDVIK - (KANTHAL INDIA, HOSUR)
JLC ELECTROMATE-JAIPUR (FOR KX AND SNX)

PVC COMPOUND FOR INSULATION AND FRLS SHEATH

M/S SHRIRAM
M/S KUND KUND POLYMER
M/S KALPANA INDUSTRIES
M/S AIRCON PNEUMATICS PVT. LTD., BHIWADI
M/S BIHANI MANUFACTURING COMPANY, NEW DELHI
M/S LG CHEMICALS
M/S CORDS CABLES, BHIWADI
M/S UNIVERSAL POLYCHEM, DELHI
M/S DELTON CABLE-FARIDABAD
M/S SCJ PLASTICS, NEW DELHI
M/S PARAGON
M/S BHARAT PLASTICS (POLYCAB GROUP)

MASTER BATCH

M/S SHRIRAM
M/S SARAS POLYPRODUCTS, BHIWADI
M/S SCJ PLASTICS, NEW DELHI
M/S BHARAT PLASTICS (POLYCAB GROUP)

See email

[Signature]
AD



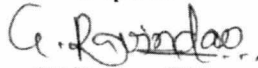
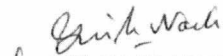
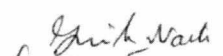
	BHEL: BAP: RANIPET ELECTRICAL C&I Pre-Qualification requirement for SCREENED CABLES	REF: RFW80197:SCREENED CABLES
		REVISION NO:00
		DATE:13.07.2018

The Qualification requirements (QR) for participation in the tender for SCREENED CABLES is detailed below. Bidders should meet the qualification requirement specified below.
Offers of bidders who do not meet qualification requirement will not be considered.

ITEM: SCREENED CABLES

SCOPE: Supply : Yes; Erection & Commissioning : No;	
1	Vendor shall be a manufacturer of SCREENED cables.
2	Vendor shall produce test reports establishing in house test facilities
3	Capability of manufacturing capacity : 100 KM / month.
4	Vendor should have manufactured and supplied 1 KM of FRLS cable
5	Vendor should have supplied 20 KM of similar cable to any one project.
6	Vendor should be approved by NTPC for supply of similar cables
7	Vendor to furnish technical catalogue for cables.

Documentary evidence for the above requirements shall be submitted by bidder.
Final acceptance of Bidder is subject to approval of End customer.

Prepared  GR/Sr.Engr/ECI	Reviewed  f. MJM/AGM/ECI	Approved  f. MJM/AGM/ECI
---	---	--

(4)

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT :							
			ITEM :		QP NO.:		PACKAGE :							
			SUB-SYSTEM:		REV.NO.:		CONTRACT NO. :							
				DATE:		MAIN-SUPPLIER:								
PAGE: OF....														
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D*	M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	**	10.	11.	

(16)

		LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFIED IN COLUM "N" AS 'W'			DOC. NO.:		REV..... CAT.....		
MANUFACTURER/ SUB-SUPPLIER			MAIN-SUPPLIER		FOR NTPC USE				
SIGNATURE						REVIEWED BY		APPROVED BY	

ENDORSEMENT SHEET FOR QP REFERENCE / STANDARD / FIELD QUALITY PLAN (RQP / SQP/RFQP/SFQP)			
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION			To be filled in by NTPC
PROJECT NAME	NTPC-NCTPP DADRI-II (4X490MW) FGD PACKAGE		REVIEW & ENDORSEMENT BY NTPC PROJECT SPECIFIC QP NUMBER ALLOTTED QP NO.: REV. NO.: DATE: ** The RQP/SQP/RFQP/SFQP once endorsed for a particular contract shall remain valid even though the original QP may have expired or revised, unless / otherwise mutually agreed with the supplier. ①
CONTRACT NO	CS-6130-109-9, BHEL WORK ORDER NO (G501 & G502)		
MAIN SUPPLIER	BHARATHEAVY ELECTRICALS LIMITED (RANIPET)		
MANUFACTURER WORKS & ADDRESS			
ITEM /EQUIPMENT / SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE / SIZE /RATING etc.			
APPROVED QP NO.: RQP/SQP/RFQP/SFQP			
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)			(TICK APPLICABLE)
I. That the item/ component is identical to that considered for QP approval. OR. ✓			The QP is endorsed for this project without any change
II. That there are minor changes in the item/ component with respect to that considered for QP approval, however the same do not affect the contents of QP. OR			
III. That there are minor changes in the item/ component with respect to that considered for QP approval, however the same affect the QP slightly, as indicated below / in attached sheet.			
			The QP is endorsed for this project with changes as indicated. <u>DISTRIBUTION OF ENDORSEMENT OF</u> A) RQP/SQP: 1. MAIN SUPPLIER (WITH A COPY OF QP) 2. MANUFACTURER 3. RIO 4. CQA-SPL 5. CQA-O/C B) RFQP/SFQP: 1. MAIN SUPPLIER (with a copy of QP) 2. MANUFACTURER 3. NTPC FQA (with a copy of QP) 4. NTPC Erection (with a copy of QP) 5. CQA-SPL 6. CQA-O/C
SIGN.: (Main Supplier) DATE:	SIGN.: (Manufacturer)	DATE:	NTPC (Reviewed /Approved by/ Date & Seal)

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
--	---

i.	Item/Scope of Sub-contracting			
ii.	Address of the registered office	Details of Contact Person (Name, Designation, Mobile, Email)		
iii.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)		
iv.	Annual Production Capacity for proposed item/scope of sub-contracting			
v.	Annual production for last 3 years for proposed item/scope of sub-contracting			
vi.	Details of proposed works			
1.	Year of establishment of present works			
2.	Year of commencement of manufacturing at above works			
3.	Details of change in Works address in past (if any)			
4.	Total Area			
	Covered Area			
5.	Factory Registration Certificate	Details attached at Annexure – F2.1		
6.	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design) Details attached at Annexure – F2.2 (if applicable)		
7.	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3		
8.	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4		
9.	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5		

	CORPORATE QUALITY ASSURANCE SUB-VENDOR QUESTIONNAIRE
--	---

10.	Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing	Details attached at Annexure – F2.6												
11.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.7												
12.	Testing facilities (List of testing equipment)	Details attached at Annexure – F2.8												
13.	If manufacturing process involves fabrication then- List of qualified Welders List of qualified NDT personnel with area of specialization	Applicable / Not applicable Details attached at Annexure – F2.9 (if applicable)												
14.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	Applicable / Not applicable Details attached at Annexure. –F2.10 (if applicable)												
15.	Supply reference list including recent supplies	Details attached at Annexure – F2.11 (as per format given below)												
	<table border="1" style="width: 100%;"> <tr> <th style="width: 10%;">Project/ package</th> <th style="width: 10%;">Customer Name</th> <th style="width: 30%;">Supplied Item (Type/Rating/Model /Capacity/Size etc)</th> <th style="width: 20%;">PO ref no/date</th> <th style="width: 20%;">Supplied Quantity</th> <th style="width: 10%;">Date of Supply</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply							
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply									
16.	Product satisfactory performance feedback letter/certificates/End User Feedback	Attached at annexure - F2.12												
17.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note:- Reports need not to be submitted	Applicable / Not applicable Details attached at Annexure – F2.13 (if applicable)												
18.	Statutory / mandatory certification for the proposed product	Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)												
19.	Copy of ISO 9001 certificate (if available)	Attached at Annexure – F2.15												
20.	Product technical catalogues for proposed item (if available)	Details attached at Annexure – F2.16												
<table border="1" style="width: 100%;"> <tr> <td style="width: 15%;">Name:</td> <td style="width: 30%;"> </td> <td style="width: 10%;">Desig:</td> <td style="width: 20%;"> </td> <td style="width: 10%;">Sign:</td> <td style="width: 15%;"> </td> <td style="width: 10%;">Date:</td> <td style="width: 10%;"> </td> </tr> </table>			Name:		Desig:		Sign:		Date:					
Name:		Desig:		Sign:		Date:								

Company's Seal/Stamp:-