

NTPC Ltd

Vendor Enlistment Cell

USSC, CPG-1, Nava Raipur

Qualifying Requirements for Vendor Enlistment for Supply of 400 KV Current Transformer (CT), (Category-1)

A	MEG Details:	
1	MEG No.	87MEG-10
2	MEG DESCRIPTION	400 kV Current Transformer (CT) (Enlistment Category-1)
3	RESPONSIBILITY CENTRE	CPG-1/ VEC
4	CRITICAL/ NOT CRITICAL (for Requirement of Physical Assessment)	Critical
B	TECHNICAL CRITERIA OF QR: a) The applicant should be a manufacturer of Current Transformer of 400 kV Voltage class or above. b) The applicant should have supplied, at least one (1) number of Current Transformer of 400 kV Voltage class or above which should have been in successful operation for at least one (1) year prior to the last date of submission of application.	
C	Documents required in support of meeting QR: (1) Supporting Documents for QR - B. (a) Latest Annual report or Udyam Registration / NSIC / SSI / MSME registration certificate / Valid BIS license / ISO certificate / Certificate of registration/Type Test Report / any other statutory document as a proof of	

	<p>being manufacturer of the Current Transformer. Brief details of Manufacturing facilities or the Standard published catalogue for Current Transformer to be given.</p> <p>(b) Copy of Purchase order(s) in support of award/copy of invoice to establish successful execution of the supply of Current Transformer as per the QR. Certificate issued by the end user for successful operation of supplied current transformer from the date of commissioning.</p>
D	<p>Documents to be submitted to establish the Execution Capability (EC):</p> <p>In addition to the documents required in support of meeting technical requirements as stated above, following documents are required to be submitted by the Applicants applying for enlistment: -</p> <ol style="list-style-type: none"> 1. Three (3) POs of the highest executed values of similar works (see definition at point E: Note- 1 below) executed during previous five (5) years from the last date of submission of application. Copy of Invoice / Completion certificate from the concerned buyer/s in support of successful execution of supply against the POs to be submitted. These will be required for calculation of execution capability. 2. Financials: <ol style="list-style-type: none"> 2.1 Audited balance sheet including Profit & Loss statement for the previous three completed financial years reckoned from the date of application. In case the audited result for the preceding financial year is not available, certification of financial statements from a practicing-chartered accountant is to be uploaded. In case, applicant is not able to submit the certificate from practicing chartered accountant certifying its financial parameters, the audited results of the three consecutive financial years preceding the last financial years shall be considered for evaluating the financial parameters. Further, a certificate would be

required from the CEO/CFO stating that the financial results are under audit as on date of application and certificate from the practicing Chartered Accountant certifying the financial parameters are not available.

2.2 In case the applicant is not able to furnish its audited financial statements on stand-alone entity basis, the unaudited unconsolidated financial statements of the applicant can be considered acceptable provided the applicant further furnishes the following documents for substantiation of its qualification.

- (a) Copies of the unaudited unconsolidated financial statements of the applicant along with copies of the Audited consolidated financial statements of its Holding Company.
- (b) A Certificate from the CEO/CFO of the Holding Company, as per the format enclosed in the bidding documents, stating that the unaudited unconsolidated financial statements form part of the Consolidated Annual Report of the company.

2.3 GSTIN certificate, PAN, Power of attorney, Letter of undertaking, works information etc. as mentioned in enlistment application pages of website <https://vdc.ntpc.co.in>.

Note:

- (i) Maximum Three Credential Order(s) / Similar Work(s) shall be considered for calculation of the EC.
- (ii) "All other terms & conditions of enlistment are as per the STC available at VDC portal <https://vdc.ntpc.co.in>".

E	Note-1	Similar works means: "Supply of Current Transformer of 400 kV Voltage class or above"
	Note-2	The executed value means Basic value of quantity of similar works executed/supplied against the reference

		PO (also applicable to partly executed POs as on date of application). Where PO value is composite (i.e. including Taxes etc.), the applicant to give item-wise break-up of Composite PO value mentioning Basic Value, Taxes etc.
F	TECHNICAL SPECIFICATION	Attached as Annexure-I
G	QUALITY PLAN	Attached as Annexure-II



A Maharatna Company

[Rev-00, Dated 01.05.2024]

TECHNICAL SPECIFICATION 400 KV CURRENT TRANSFORMER

1.00.00 CURRENT TRANSFORMER: CODES AND STANDARDS

Current transformers: IEC 61869-1&2, IS: 2705, IS:16227
Insulating oil: IS:335, IEC:60296

2.00.00 GENERAL REQUIREMENTS:

- a. The Current transformers shall be single phase transformer units and shall be supplied with a common marshalling box for a set of three single phase units. All exposed mild steel shall be hot dip galvanized or painted with grey colour of shade RAL 9002. The current transformers shall be hermetically sealed units. The current transformers shall be provided with filling and drain plugs. Polarity marks shall indelibly be marked on each current transformer and at the lead terminals at the associated terminal block. For Current transformers, no oil shall come in contact with zinc galvanized surface.
- a) The current transformer shall be with **Polymer Insulator**. For Current transformer shall have cantilever strength of not less than 500kg for 400kV.
- b) Polarity marks shall indelibly be marked on each instrument transformer and at the lead terminals at the associated terminal block.

3.00.00 CURRENT TRANSFORMERS (CTs)

- a) The CTs shall have single primary of either ring type or hair pin type or bar type. Wound primary is not acceptable.
- b) In case of "Bar Primary" inverted type CTs, the following requirements shall be met:
 - i) The secondaries shall be totally encased in metallic shielding providing a uniform equipotential surface for even electric field distribution.
 - ii) The lowest part of insulation assembly shall be properly secured to avoid any risk of damage due to transportation stresses.
 - iii) The upper part of insulation assembly sealing on primary bar shall be properly secured to avoid any damage during transportation due to relative movement between insulation assembly and top dome.
- c) The insulator shall be one piece without any joint. The CT shall be provided with oil sight glass.

TECHNICAL SPECIFICATION 400 KV CURRENT TRANSFORMER

- d) The core lamination shall be of cold rolled grain-oriented silicon steel or other equivalent alloys. The cores shall produce undistorted secondary current under transient conditions at all ratios with specified parameters.
- e) Different ratios shall be achieved by secondary taps only, and primary reconnections shall not be accepted.
- f) The guaranteed burdens and accuracy class are to be intended as simultaneous for all cores.
- g) The instrument security factor at all ratios shall be less than five (5) for metering core. If any auxiliary CT/reactor is used, then all parameters specified shall be met treating auxiliary CTs/reactors as integral part of CT. The auxiliary CT/reactor shall preferably be in-built construction of the CT. In case it is separate, it shall be mounted in secondary terminal box.
- h) The physical disposition of protection secondary cores shall be in the same order as given under CT requirement table-1 given below.
- i) The CTs shall be suitable for high-speed auto-reclosing.
- j) The secondary terminals shall be terminated on stud type suitable numbers of non-disconnecting and disconnecting terminal blocks inside the terminal box of degree of protection IP:55 at the bottom of CT.
- k) The CTs shall be suitable for horizontal transportation.
- l) The CTs shall have provision for taking oil samples from bottom of CT without exposure to atmosphere to carry out dissolved gas analysis periodically. Contractor shall give his recommendations for such analysis, i.e. frequency of test, norms of acceptance, quantity of oil to be withdrawn, and treatment of CT. Vendor shall supply 2nos. oil sampling device for every 20nos. Minimum 2nos. oil sampling device for each substation.
- m) The CT shall have provision for measurement of capacitance and tan delta as erected at site.

TECHNICAL SPECIFICATION 400 KV CURRENT TRANSFORMER

4.00.00 GENERAL PARAMETERS FOR CURRENT TRANSFORMERS:

SN	Description	Parameter
a)	One minute power frequency withstand voltage between secondary terminal and earth	5kV
b)	Partial discharge level	10 pico Coulombs max.
c)	Temperature rise	As per IEC
d)	Type of insulation	Class A
e)	Number of cores	Five (5): Details are given in table-1 below
f)	Rated frequency	50 Hz
g)	System neutral earthing	Effectively earthed
h)	Installation	Outdoor (up right)
i)	Seismic acceleration	0.3 g horizontal
j)	Number of terminals in marshalling box.	All terminals of control circuits wired up to box marshalling box plus 20 terminals spare.

400 kV Current Transformers (oil filled type):

SN	Description	Parameter
a)	Rated Short time thermal current	63kA for 1sec
b)	Rated Dynamic current	125kA(peak)
c)	Rated Extended Primary current	120% of rated primary current as per SLD

5.00.00 TESTS:

- a) The current transformers shall conform to type tests and subjected to routine tests in accordance with the relevant IEC/IS and shall also conform to the following additional type tests as applicable:
 - i) Radio Interference and Corona test
 - ii) Thermal withstand test i.e. application of rated voltage and rated current simultaneously by synthetic circuit.
 - iii) Seismic withstand test along with structure (for 400kV only)
 - iv) Thermal co-efficient test i.e. measurement of Tan-Delta as function of temperature (at ambient and between 80 deg. C and 90 deg. C) and voltage (at 0.3, 0.7, 1.0 and 1.1 Um).
 - v) Multiple chopped impulse test on Primary winding.
 - vi) In addition to routine tests as per IEC/IS, measurement of partial discharge in continuation with power frequency withstand test required for 400 kV current transformer.

TECHNICAL SPECIFICATION 400 KV CURRENT TRANSFORMER

b) ISF (Instrument Security Factor) test will be done as part of Routine acceptance test.

Table-1

CORE DETAILS OF 400kV CTs:

- i) Following details shall be applicable for all protection class CT cores.
- ii) The rated extended primary current of the CTs shall be 120% continuous of 3000A/2000A.

Core No	Current (Amp)	Ratio	Output Burden (VA)	Accuracy Class as per IEC	Min Knee Point Voltage (Vk)	Max CT Sec Winding Res. (Ohm)	Max Exciting Current in mA at Vk	Application
1	3000/2000/1000/1		-----	PS	3000/2000 /1000	15/10/5 Ohm	20/30/60	Bus Differential check
2	3000/2000/1000/1		-----	PS	3000/2000/1000	15/10/5 Ohm	20/30/60	Bus Differential main
3	3000/2000/1000/50/0/1		20/20 / 20/20	0.2S				Metering and synch.
4	do		do	0.2S				For ABT Metering
5	3000/2000/1000/50/0/1		----	PS	3000/2000/1000/50/0/1	15/10/5 /2.5Ohm	20/30/60/120	Transformer Back up / line protection
6	3000/2000/1000/50/0/1		----	PS	3000/2000/1000/50/0/1	15/10/5 /2.5Ohm	20/30/60/120	Trans Diff./ Line protection

Physical arrangement of CTs shall be as per Protection SLD.

Note: The supporting calculation to be furnished during detail engineering for CT Parameters.

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Annexure-II



USSC-CPG1

PPG-QA



Standardised Quality Plan	
Item	Oil Filled Current Transformer upto 800KV
SQP No.	CPG-QA-SQP- E-069
Rev	00

JAI PRAKASH MAURYA Digitally signed
by JAI PRAKASH MAURYA



MANUFACTURING QUALITY PLAN

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY	
					M	C/N			D*	M		
1	2	3	4	5	6		7	8	9	D*		11
I RAW MATERIAL & BOUGHT OUT ITEMS												
1.0	Transformer Oil [Insulating Oil]	1.Appearance 2.Density 3.Kinematic Viscosity a) at 37.8 Deg C b) at -30 deg C 4. Interfacial Tension 5. Flash Point (6. Pour Point 7. Neutralisation Number 8. Corrosive Sulphur 9. Inhibitor Content % wt 10. Specific resistance (Resistivity).at 90 deg.C 11. Electrical strength (BDV) New Untreated Oil 12.Dielectric Dissipation factor - Tan Delta 13.Oxidation Stability. a) Total Acidity b) Sludge Content	Major	Visual Test	1 Sample / Tanker "	- "	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS			V V V V V V V V V V V V V V V	- - - - - - - - - - - - - - -	Raw material / BOI TC's will be maintained for NTPC verification at any time during inspection
2.0	Enamelled Cu Wire	1.Insulation Defects 2. Dimensions 3. Resistance 4. Elongation. 5. Flexibility & Adherence 6. Restance to abrasion 7. Heat Shock test 8. Cut Through test 9. Breakdown voltage 10. Springness (Spring back) 11. Solvent test.	Major	Visual Meas. Test	5 Nos / lot "	- "				V V V V V V V V V 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 IDENTIFY IN COLUMN "N" AS "W"

NOTE : # NTPC Inspection Engineer to check , approval date / revision no. reference documents at the time of inspection

MANUFACTURING QUALITY PLAN

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY		
					M	C/N				M	C	N
1	2	3	4	5	6		7	8	9	D*	10	11
I RAW MATERIAL & BOUGHT OUT ITEMS												
3.0	Gasket (O Rings)	1.. Specific Gravity. 2. Hardness 3. Elongation 4. Ageing Test in Tr. Oil 5.Compression set	Major	Test	1Sample / lot	-	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS			V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
4.0	Cable paper (Kraft Paper)	1. Visual (Appearance) 2.Elec. Breakdown Strength 3.Density (apparent bulk density) 4. Tensile Index (factor) 5. Elongation. 6.Conductivity. Of Aqueous Extract 7. Ash Content (Annealing residue) 8. Capillary water rise 9. Air Permeance (Peameability)	Major	Phy. Test.	100% 1Sample / lot	-				P	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
			"	"	"	-				V	-	
5.0	Porcelain Insulator	1. Major Dimensions 2. Visual (Surface defects) 3. Electrical Routine test. 4. Porosity test 5. Temp. Cycle test 6. Creepage distance 7. Following test in case of Jointed Porcelain a) Beam test for Joint , b) Radial dielectric test c) temp. Cycle test.	Major	Meas. Test.	IS 5621-1980 100% 100% IS 5621-1980 IS 5621-1980 1sample / lot 1sample / lot IS 5621-1980 IS 5621-1980	- - 10% - - - - -			V	-		
			"	Phy.	100%	-			V	-		
			"	Test.	100%	10%			V	V		
			"	"	IS 5621-1980	-			V	-		
			"	"	IS 5621-1980	IS 5621-1980			V	V		
			"	Meas.	1sample / lot	1sample / lot			V	V		
			"	Test.	IS 5621-1980	IS 5621-1980			V	-		
6.0	Semiconducting Paper.	1. Thickness 2. Density 3. Tensile Strength 4.Elongation 5. Resistivity 6. Porosity (Bendsten) 7. Conductivity	Major	Meas. Test.	1 sample / lot	-			V	-		
			"	"	"	-			V	-		
			"	"	"	-			V	-		
			"	"	"	-			V	-		
			"	"	"	-			V	-		
			"	"	"	-			V	-		
			"	"	"	-			V	-		

LEGEND : * RECORDS IDENTIFIED WITH "TICK" (/) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

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MANUFACTURING QUALITY PLAN

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			
					M	C/N				M	C	N	
1	2	3	4	5	6		7	8	9	D*	10	11	
I RAW MATERIAL & BOUGHT OUT ITEMS													
7.0	Primary Bar (Al / Cu) (As applicable)	1. Dimension	Major	Meas.	1Sample / lot	-	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS			V	--	--	
		2. Visual	"	Phy	"	-				V	--	--	
8.0	Torroidal Core (CRGO strip wound core)	1. Strip Thickness	Major	Visual	100%	-				V	--	--	
		2. Silicon content	"	Meas.	1Sample / lot	-				V	--	--	
		3. Watt loss (power loss)	"	Test.	"	-				V	--	--	
		4. Specific gravity	"	"	"	-				V	--	--	
		5. Stacking factor.	"	"	"	-				V	--	--	
9.0	Core for Metering	1. Strip thickness	Major	Meas.	1Sample / lot	-				V	--	--	Cores required for 0.2 Accuracy
		2. Stacking factor.	"	"	"	-				V	--	--	
10.0	Aluminium foil	1. Thickness	Major	Meas.	1Sample / lot	-				V	--	--	
		2. Purity	"	Test.	"	-	V	--	--				
		3. Visual	"	Phy.	"	-	V	--	--				
11.0	P.E.T.P FILM	1. Breakdown Voltage	Major	Test.	1Sample / lot	-	V	--	--				
		2. Volume Resistivity	"	"	"	-	V	--	--				
		3. Surface Resistance	"	"	"	-	V	--	--				
		4. Tensile Strength	"	"	"	-	V	--	--				
		5. Elongation	"	"	"	-	V	--	--				
		6. Density	"	"	"	-	V	--	--				
		7. Dielectric Constant	"	"	"	-	V	--	--				

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MANUFACTURING QUALITY PLAN

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY		11	
					M	C/N				D*	**	10		
I RAW MATERIAL & BOUGHT OUT ITEMS														
12.0	Base Pedestal	1. Major Dimensions 2. Visual	"	Meas.	1Sample / lot 100%	-	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS			V	--	--		
13.0	Check on Hot Dip Galvanised item (if applicable)	1. wt. of Zn coating. 2. Adhesion test 3. Zinc thickness test 4. Visual defects	Major	Test.	1Sample / lot "	-				V	--	--	Applicable for Base Pedestal & Terminal Box	
14.0	Terminal Connector (If Applicable)	1. Major Dimensions 2. Visual 3. Tensile Test 4. Resistance test	Major	Meas. Phy. Test. Test.	IS -5561-1970 " " "	-				V	--	--		
15.0	Cable Crepe Paper	1. Area Weight (Grammage) 2. Tensile Index 3. Elongation 4. Conductivity of Aqueous Extract 5. Ash Content	Major	Test.	1Sample / lot " " " "	-				V	--	--		
16.0	Terminal Block	1. Make, Type, Rating 2. Visual	Minor	Visual	1Sample / lot "	-				V	--	--		
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					M	C/N				M	C	N
1	2	3	4	5	6		7	8	9	D*	10	
I RAW MATERIAL & BOUGHT OUT ITEMS												
17.0	Fastners	1. Make 2. Visual / Dimensions	Major	Phy.	1Sample / lot	-	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS			V	-	
			"	"	"	-				V	-	
18.0	Head Housing	1. Dimension 2. Visual 3. Leak Test	Major	Meas.	1Sample / lot	-				V	-	
			"	"	100%	-				V	-	
			"	Phy.	100%	-				V	V	
			"	"	100%	-				V	-	
19.0	Bellow	1. Dimension 2. Visual	Major	Meas.	1Sample / lot	-		V	-			
			"	"	100%	-		V	-			
20.0	D.C.C. Cu / Al Stranded Conductor (as applicable)	a) Diameter b) Electrical High Voltage Test	Major	Meas.	1Sample / lot	-		V	-			
			Major	Test.	"	"		V	-			
21.0	Base Plate Aluminium	1. Thickness 2. Chemical Composition	Major	Meas.	1Sample / lot	-		V	-			
			Major	Test.	"	-		V	-			
22.0	Marshalling Box (Accessory)	1. Dimension 2. HV test - 2kV for 1 min. 3. IR test - 20 M Ohm (min) 4. Component Physical check 5. Functional check 6. Painting Thickness & Paint shade 7. Adhesion Test 8. Degree of protection (IP - 55) Type Test	Major	Meas.	1 Sample / lot	1 Sample / lot	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS/ASTM D 3359/IS-13947 P1			P	V	
			"	Test.	100%	"				P	V	
			"	Test.	"	"				P	V	
			"	Visual	"	"				P	V	
			"	Test.	"	"				P	V	
			"	"	1 Sample / lot	"				P	V	
			"	"	"	"				P	V	
			"	"	Sample	Sample				P	V	

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NOTE : # NTPC Inspection Engineer to check , approval date / revision no. reference documents at the time of Ins Report verification of sealing arrangement with respect to drawing attached to type test

MANUFACTURING QUALITY PLAN

NO.	OPERATIONS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			
							M	C/N		
1	2	3	4	5	6	7	8	9	10	11
INPROCESS INSPECTION										
1.0	Secondary Winding & Taping	Visual Check	Major	Visual	100%	-				
2.0	Assembly	Base To Pedestal Assembly	Major	Visual	100%	-				
		Tank to Porcelain Assembly	Major	Visual	"	-				
		Main Assembly	Major	Visual	"	-				
2.0	Treated oil	BDV	Critical	Test						
		Loss Angle	"	"	1 Sample / flooding lot	-				
		Water Content	"	"						
3.0	Impregnation, visual leak check	Temperature & Vacuum	Critical	Meas.	Continuous	-				

Tender / PO Tech.
Specifications/ NTPC
Approved Drg./DS

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 ** M : MANUFACTURER / SUB - SUPPLIER C: MAI

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FORMAT -QS-01-QAI-P-10/F1-R1

MANUFACTURING QUALITY PLAN

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			
					M	C/N				D*	M	C		
1	2	3	4	5	6		7	8	9		10			
FINAL TESTS														
TYPE TEST Verification of type test approval from NTPC - as per PO specification requirements														
Routine Tests	1. Completeness		Major	Visual	100%	1 sample / lot	Tender / PO Tech. Specifications/ NTPC Approved Drg./DS/ IEC-60044-1/IEC 61869-2	Y	✓	P		W	CPRI Calibration Report & Comparison Report for Std. CT shall be made available	
	2. Dimensional and Physical verification		"	Meas.	1 sample / lot	1 sample / lot			✓	P		W		
	3. Verification of terminal marking and polarity		Critical.	Test	100%	100%			✓	P		W		
	4. Power Frequency test on Primary winding		"	"	"	"			✓	P		W		
	5. Measurement of Capacitance and Tan delta at 0.3 , 0.7 , 1.0 , 1.1 Um / sqrt.3		"	"	"	"			✓	P		W		
	6. Partial discharge test		"	"	"	"			✓	P		W		
	7. Power Frequency test on Secondary windings		"	"	"	"			✓	P		W		
	8. Internal Turn Over Voltage test.		"	"	"	"			✓	P		W		
	9. Measurement of secondary winding resistance and corrected to 75 deg.C		"	"	"	"			✓	P		W		
	10. Knee point voltage test - PS class core		"	"	"	"			✓	P		W		
	11. Composite Error measurement for P-class cores .(if applicable)		"	"	"	"			✓	P		W		
	12. ISF test on metering core all taps by indirect method.		"	"	"	"			✓	P		W		
	13. Determination of error for appropriate class of accuracy.		"	"	"	"			✓	P		W		
	14. Transformer Oil from CT - BDV, Tan Delta , oil leak test.		"	"	10% of lot	10% of lot					P			V
	Pre - despatch	Check for finish, Completeness of Equipment		Major	Phy.	100%			-					P
Packing	Check for packing sturdiness		Major	Phy.	100%	-	work instruction	work instruction		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.,

NOTE : # NTPC Inspection Engineer to check , approval

1. 'Y' mark in Column 'D' means such document shall be furnished by the manufacturer / supplier.
2. Calibrated equipments required for performing the tests in presence of NTPC or authorized representative, shall be arranged by the supplier without any extra cost.
3. Witness by NTPC/authorized representative (wherever applicable) shall be on randomly chosen sample/s. NTPC shall review MFRs test report for balance Qty.
4. Reference and Acceptance norms shall be derived from following in the same sequence 1) NTPC Approved drawing / data sheet; 2) NTPC tech specs. 3) Purchase Order. 4) Relevant national standard. 5) Relevant International standard. 6) Manufacturer's standard. 7) Good Engineering practices.
5. Type test clearance from NTPC site shall be reviewed during final inspection as envisaged by tender/PO specification