	FGR.'s .OGO		FACTURER'S AND ADDRESS		LT S	SWITCHGEA	R	CTURING QP NO.: REV.NO.: DATE: PAGE: O	QUALITY	PLAN	PROJECT PACKAGE CONTRACT MAIN-SUPP					
										card						
			f) Outer sheath thicks	ness Ma	ajor	Physical			Approved data	Approved data sheet	-do-		P	W	W	
	IN	D	g) Hot set test for insulation	Ma	ajor	Physical A	NU	FAC	sheet IEC 60540	IEC 60540	-do-		P	W	w	
SL. NO	COMPO & OPERAT		CHARACTERISTI	CS CI	LAS S	TYPE OF CHECK	-	NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGE	NCY		REMARKS
1	2.		3.	Ψ,	4.	5.	1 1 .	6.	7.	8.		D	M	С	N	
1.	2.				-					ð.	9.	*	**	10		
			3) Paint Thickness & Adhesion	Mi	ajor	Meas. & test	Mfr practices	-	-do-		-do-		P	-	-	
			4) Salt spray test		ajor	Meas. & test	1 sample per year		Mfr practice	Mfr Practice	-do-		P	V	V	
3	Panel Ass	embly	Panel shell assembly, &back cover assembly, Panel door assembly, hi fitting & door knob fitti etc.	nge	ajor	Process	100%	-	Mfr Internal Drgs made to meet NTPC Appd.Drgs.	Mfr Internal Drgs made to meet NTPC Appd. Drgs.	-do-		P	-	-	
			2) Size of busbar & bus finish	bar Ma	ajor	Process	100%	-	-do-	-do-	-do-		P	-	-	
			3) Colour coding of bus	bar Ma	ajor	Process	100%	-	-do-	-do-	-do-		P	-	-	
			4) Insulator type & mounting	Ma	ajor	Process	100%	-	-do-	-do-	-do-		P	-	-	
			5) Busbar support distar & tightness of bolts for Main bus bars and bus b joints		ajor	Process	100%	-	Size KGM M8 0.85 M10 1.88 M12 3.2	Size KGM M8 0.85 M10 1.88 M12 3.2	-do-		P	-	-	
						ND: * RECORD					DOC. NO.:				REV.	CAT
	UFACTURE SUPPLIER		MAIN-SUPPLIER	** P:	M: M PERFO	ALLY INCLUDEI MANUFACTURER ORM W: WITNE TPC SHALL IDEN	SS AND V: VI	ER C: MAIN SUPI ERIFICATION. AS	PLIER, N: NTPC	FOR NTPC						
		SIGNA	ATURE							USE	REVIEWED BY		AI	PROV	ED BY	APPROVAL

	FGR.'s OGO		FACTURER'S AND ADDRESS		SWITCHGE <i>A</i>	AR	QP NO.: REV.NO.: DATE:	G QUALITY	Y PLAN	PROJECT PACKAGE CONTRACT N	: : 0.:			
Ī			6) Main , Control &	Mala	D	1000/	PAGE: (	1	1.	MAIN-SUPPLII	_	1	1 1	
			Auxiliary Busbar Clearances	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
SL. NO	COMPO & OPERAT		CHARACTERISTI	CS CLAS	TYPE OF CHECK		NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANC NORMS	E FORMAT OF RECORD	AGI	ENCY		REMARKS
			6) Main , Control & Auxiliary Busbar Clearances	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
			7) Tin / silver plating / bimetallic strip /washer between Cu & Al joints	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
•			8) CT / PT mounting arrangement & tightness	Major	Process	100%	-	-do-	-do-	-do-	P	-	-	
			9) Termination for pow control circuits	er & Major	Process	100%	-	-do-	-do-	-do-	P	-	-	
			10) Lug size & crimpin quality	g Major	Process	100%	-	Mfr Internal Drgs made to meet NTPC Appd. Drgs.	Mfr Internal Drg made to meet NTPC Appd. Drgs.	s QC Records	P	-	-	
			11) Earthing busbar siz continuity; earthing of panel & door		Process	100%	-	-do-	-do-	QC Records	P	-	-	
			12) Breaker safety shut operation		Process	100%	-	-do-	-do-	QC Records	P	-	-	
			13) Spring loaded power control contacts alignment		Process	100%	-	-do-	-do-	QC Records	P	-	-	
4	Module ass	sembly	1) Component identific	ation Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
	JFACTURE	R/	MAIN-SUPPLIER	ESSENT ** M: P: PERI		ED BY SUPPLIEI R/SUB-SUPPLIE ESS AND <b>V:</b> VI	R IN QA DOCUM ER C: MAIN SU ERIFICATION. A	MENTATION. PPLIER, N: NTPC AS APPROPRIATE,	FOR NTPC	DOC. NO.:			REV.	CAT
<u>оов-8</u>	<u>UPPLIER</u>	SIGNA	TURE						USE	REVIEWED BY	A	PPRO	VED BY	APPROVAL SEAL

			ACTURER'S AND ADDRESS		ATIVE N SWITCHGEA		CTURIN QP NO.:	G QUALITY	Y PLAN	PROJECT PACKAGE	:			
	FGR.'s OGO			SUB-SYSTI	EM: LT		REV.NO.: DATE: PAGE:	OF		CONTRACT No MAIN-SUPPLIE				
			2) Component layout, mounting & dimensions	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
SL. NO	COMPO & OPERAT		CHARACTERISTI	CS CLAS S	TYPE OF CHECK	_	ANTUM CHECK	REFERENCE DOCUMENT	ACCEPTANC NORMS	FORMAT OF RECORD	AGI	ENCY		REMARKS
			3) Incoming & outgoing power & control contact assembly & alignment		Process	100%	-	-do-	-do-	QC Records	P	-	-	
			4) Power circuit wire / s termination & clearance		Process	100%	-	Mfr Internal Drgs/spec made to meet NTPC Appd. Drgs.	Mfr Internal Drg /spec made to meet NTPC App Drgs.	Records	p	-	-	
			5) Busbar joints	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
			6) Functional Checks	Major	Process	100%	-	-do-	-do-	QC Records	P	-	-	
6	Control W	riring	1) Wire Size & lug size Colour of wire	Minor	Visual	100%	-	NTPC apprd. Wiring diagram	NTPC apprd. Wiring diagram	QC Records	P	-	-	
			2) Proper wire Clampin Ferruling	g & Minor	Visual	100%	-	Shop practice	Shop practice	QC Records	P	-	-	
			3) Continuity as per wirdrg	1	Test	Sample	-	NTPC Appr. Drg.	NTPC Appr. Drg.	QC Records	P	-	-	
			4) Tightness of terminat & crimping check	tion Major	Test	100%	-	Mfr. Std	Mfr. Std	QC Records	P	-	-	
D	Final Inspection	n												
2			1. Overall visual check aesthetics, verticality of panels and alignment		Visual	100%	10%	Approved GA Drgs	Approved GA Drg.	TC	P	W	W	
	JFACTURE	<b>R</b> /	MAIN-SUPPLIER	ESSENT ** M: P: PERI	TALLY INCLUDI MANUFACTURE	ED BY SUPPLIED ER/SUB-SUPPLIED ESS AND V: V	R IN QA DOCU ER C: MAIN SU ERIFICATION.	JPPLIER, N: NTPC AS APPROPRIATE,	FOR	DOC. NO.:			REV	CAT
SUB-S	UPPLIER	SIGNA	TURE						NTPC USE	REVIEWED BY	A	PPRO	VED BY	APPROVAL SEAL

	FGR.'s .OGO		FACTURER'S AND ADDRESS		Г SWITCHGE	AR	CTURINC QP NO.: REV.NO.: DATE: PAGE: O	G QUALITY	Y PLAN	PROJECT PACKAGE CONTRACT MAIN-SUPPI				
			between two transport sections											
SL. NO	COMPO & OPERAT		CHARACTERISTI	CS CLAS	TYPE OF CHECK		NTUM HECK	REFERENCE DOCUMENT	ACCEPTANC NORMS	E FORMAT OF RECORD	AG	ENCY		REMARKS
			2. Verification of overa Dimensions Including s steel thickness	1,1410	Meas.	100%	1 Sample of each type of panel/lot	Approved GA	Approved GA Drg.	TC	P	W	W	
			3)Busduct interface, ph sequence, flange dimen & clearances		r Visual	100%	100%	NTPC appd Drg / NTPC Specification	NTPC appd Drg NTPC Specification		P	W	W	
			4. Busbar (Main –horiz ) – clearances, color co- phase sequence identification for each transport unit		a Meas. & Visual	100% Transport Units	10%	NTPC Appr. Drgs / NTPC Specification	NTPC Appr. Drg / NTPC Specification	gs TC	P	W	W	
			5. Busbar support arrangement : centre – centre distance between supports	Majo	r Meas	100%	10%	NTPC accepted Type test reports	NTPC Appd Drg NTPC spec.	TC TC	P	W	W	
			6. Overlapping of busba joints	r Majo	Meas.	100%	10%	NTPC appd. Drgs	NTPC appd. Drg	rs TC	P	W	W	
			7. Verification of tights of busbar joints by torc wrench		a Mech.	100%	10%	Size KGM M8 0.85 M10 1.88 M12 3.2	Size KGM M8 0.85 M10 1.88 M12 3.2	TC	P	W	W	
			8. CT /PT fixing & mounting arrangement	Majo	r Visual	100%	10%	NTPC Speci	NTPC Spec.	TC	P	W	W	
	JFACTURE SUPPLIER	CR/	MAIN-SUPPLIER	ESSEI ** N P: PE	TIALLY INCLUD H: MANUFACTUR RFORM W: WITH	DS, INDENTIFIEL ED BY SUPPLIER ER/SUB-SUPPLIEI NESS AND V: VE ENTIFY IN COLUM	IN QA DOCUM R C: MAIN SUP RIFICATION. A	ENTATION. PLIER, N: NTPC S APPROPRIATE,	FOR NTPC	DOC. NO.:			REV.	CAT
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		ANUFACTURER'S AME AND ADDRESS		SWITCHGEA	R	CTURING QP NO.: REV.NO.: DATE: PAGE: O	QUALITY		PROJECT PACKAGE CONTRACT MAIN-SUPPI		T		
L. O	COMPONER & OPERATIO	CHARACTERISTIC	CLAS S	TYPE OF CHECK	-	NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGI	ENCY	,	REMARKS
		9. Check shrouding of accessible live parts, Ca supports and tool falling shroud in cable alley and application of PVC sleeves on busbars		Visual	100%	Random	NTPC Spec	NTPC Spec.	TC	P	W	W	
-		10. Verification of Components for make, type, rating & layout	Major	Visual	100%	10% of each type of module per lot	Makes as per LOA / Endorsement Sheet Type, rating & Layout as per NTPC approved GA / scheme drg	Makes as per LOA / Endorsement Sheet Type, rating & Layout as per NTPC approved GA / scheme drg	TC	P	W	V	
-		11. Check control wiring terminal arrangement & ferruling	Major	Visual	100%	10% Same as above	NTPC apppd drg	NTPC Appd drg	TC	P	W	W	
		12. Safety Shutters operation check	Critica 1	Electrical	100%	10% Same as above	NTPC Specification	NTPC specification	TC	P	W	W	
		13. Check door interlock defeat interlock & adlocking feature	& Major	Electrical	100%	10% Same as above	NTPC Specification	NTPC specification	TC	P	W	W	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

	GR.'s OGO			ATIVE N SWITCHGEA EM: LT	AR	QP NO.: REV.NO.: DATE: PAGE: O			PACKAGE CONTRACT MAIN-SUPPI				
L. <b>O</b>	COMPONEN & OPERATION	CHARACTERISTICS	S CLAS S	TYPE OF CHECK		NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AG	ENCY	?	REMARKS
		14. Mech operation test for ACB as per IS	Or Critica	Electrical	100%	10 Same as above	IS 13947	IS 13947	TC	P	W	W	
		15. Breaker operation at service, test & isolate position	Critica 1	Electrical	100%	100%	IS 13947; NTPC appd drg	NTPC Spe;cification	TC	P	W	W	
		16. Power & control drawout contacts alignme check	Major	Electrical	100%	10% of each type of module per lot	NTPC Specification	NTPC Specification	TC	P	W	W	
		17. Check for Breaker antipumping & trip free feature	Major	Electrical	100%	100%	NTPC Specification	NTPC Specification	TC	P	W	W	
		18. Earthing of ACB Crac	ile Major	Visual	100%	10%	NTPC Spec.	NTPC Spec.	TC	P	W	W	
		19. Interlocks & operation check: - elect. / mech - open, close: under test, service & isolation position	Critica	Electrical	100%	10% of each type of module per lot	Approved drgs & NTPC Specification	Approved drgs & NTPC Specification	TC	P	W	W	
		21. Earth bus dimensions, earthing of drawout modules, door etc.	Major	Electrical.	100%	10% of each type of module per lot	NTPC Appd GA Drg	NTPC Appd GA Drg	TC	P	W	W	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

		FACTURER'S AND ADDRESS					G QUALITY	Y PLAN	PROJECT	:			
	FGR.'s OGO		SUB-SYSTI	SWITCHGEA EM: LT	.K	QP NO.: REV.NO.: DATE: PAGE: O	)F		PACKAGE CONTRACT MAIN-SUPP				
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		22. Check Paint shade, thickness, Adhesion & finish	Major	Visual/Test	100% for shade & finish; 2 - 3 samples / lot for thickness & adhesion check	2 - 3 samples / board	NTPC approved drg. For shade Paint Thickness to be checked as per NTPC spec.	NTPC approved drg. For shade Paint Thickness t be checked as per NTPC spec.		P	V	W	Paint adhesion check by cross hatch method using adhesive type
		23. draw in- draw out- of in of modules at random check damages of fixed contacts and lyra contact any	n and	Visual	Random	Random	No damages			P	V	V	7
		24. Degree of protection check, check profile & fixing of gaskets		Visual	2 - 5 samples at gasketted joints per board	2 - 5 samples at gaskette d joints per board	NTPC approved drgs / NTPC Specification	No insertion possible from openings & gasketted joints	TC	P	V	W	7 Paper insertion method for IP 5X compartments & 1 mm wire insertion method for IP 4X compartments.  Type, Dimensions & profile of the gaskets should be same as type tested panel gaskets

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MANUFACTURER/	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR			
SUB-SUPPLIER			NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL
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	FGR.'s LOGO		FACTURER'S AND ADDRESS		SWITCHGE A		CTURINO  QP NO.:  REV.NO.:  DATE:  PAGE: O		ENT NORMS OF AGENCY						
SL. NO	COMPO & OPERAT		CHARACTERISTI	CS CLAS S	TYPE OF CHECK	-	ANTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS		A	GEN	NCY		REMARKS
			25. IR Test before & aft the HV Test	ter Major	Electrical.	100%	100%	IS-8623	IS-8623	TC			W	W	
			26. HV test on Power & control circuit.	Critica	Electrical	100%	100%	IS-8623	IS-8623	TC		2	W	W	
			27. Fitting of sheet steed covers at both ends of transport units	Major Major	Visual	100%	100%	NTPC Spec.	NTPC Spec.	TC			V	V	Surveillance check by Main contractor / NTPC
2	Packing	g	-Completeness -Sturdiness -Loose Items	Major	Visual	100%	-	Mfr. Std. Practice	Mfr. Std. Practice	QC Records			-	-	

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MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

		ITI	EM : MV Switrch	gear	INDICATIV	E QUAL	ITY PLAN			QP.NO:					REVIEWED BY	APPROVED BY
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Sl No	COMPONENT & OPERATIONS	CH	IARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM (	OF CHECK 6 C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		A(	GEN C	CY	REMARKS	
1	2		3	4	5	O M	lo C/N	7	8	9	D	**	10	IN	11	
1.00	Raw Materi	al/	Bought out Item	ı Check	  S-	<u> </u>				<u> </u>	*		ļ	<u> </u>		
1	CT's		Make, type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., App. Drg., Appd. Vendor List	As per P.O.Spec., App. Drg. , Appd. Vendor List	QC Record		P	v	-		
		2	All routine tests as per IS- 2705	Critical	Elec	100%	type	IS- 2705/ App. Drg./ App. Data sheet	IS- 2705/ App. Drg./ App. Data sheet	Supplier TC	√	V	V	-		
		3	PD before & after Pig Tail Connection	Critical	Elec	100%	10% of each typr	CT mfr standard	CT mfr standard	QC record		P	V	-		
2	PT's	1	Make, type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., App. Drg., Appd. Vendor List	As per P.O.Spec., App. Drg., Appd. Vendor List	QC Record		P	V	-		
		2	All routine tests as per IS- 3156	Critical	Elec	100%	10% of each type	IS- 3156/App. Drg./ App. Data sheet	IS- 3156/App. Drg./ App. Data sheet	Supplier TC	1	V	V	-		
3	Numerical Protection Relays	1	Make ,Type & rating	Major	Visual	100%	10% of each type	As per P.O.Spec., Appd. Vendor List	As per P.O.Spec., Appd. Vendor List	QC Records		P	V	-		
		2	FAT	Major	Elec	(AQL 1.5) as	etion Levels, S1 per IS2500 Part- pe of relay	As per Approved FAT procedure		FAT Report	<b>V</b>	Р	W	W	FAT inspection on BHEL / Vendor wo	Panel / Loose Relays at rks.
4	Door Gasket	1	Profile	Minor	Visual	1 Sample per lot	1 Sample per lot	Mnfr std./ spec.	Mnfr std./ spec.	QC record		P	v	-	Panel Type Test Re Protection for Refer inspection	
5	Bus bar Support Insulator/ Seal off bushing	1	Cantillever Strength	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS 9431	- Mnfr / BHEL std./drg / IS- 9431	Supplier TC		v	v	-	Not applicable for i	nter-panel SOB
		2	HV Test	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS 9431	Mnfr / BHEL std./drg / IS- 9431	Supplier TC		V	V	-		
		3	PD Test	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS 9431	Mnfr / BHEL std./drg / IS- 9431	Supplier TC		v	v	-		
		4	Comparative Tracking Index	Major	Test	Supplier std.	Supplier std.	Mnfr / BHEL std./drg / IS 9431	>=600V	Supplier TC		V	V	-		
		5	Dimension	Major	Meas.	Supplier std.	Supplier std.	BHEL drg.	BHEL drg.	QC Record	Ĺ	P	V			

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		ITI	Eм : MV Switrchg	gear	INDICATIV	VE QUAL	ITY PLAN	:		QP.NO:					REVIEWED BY	APPROVED BY
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Sl No	COMPONENT & OPERATIONS		HARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AC	GEN(	CY	REMARKS	-
						6 M	6 C/N						C			
1	2		3	4	5			7	8	9	D *	**	10		11	
В	In process c		cks													
1	Vacuum Circuit	1	Type & Rating	Major	Visual	100%		Appd. Drawing	Appd. Drawing	Test Record		P	V	-		
	Breaker	2	HV Test on Power Circuit	Major	Test	100%	Special	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		3	IR Test on Main, Auxiliary/ Control Circuit	Major	Test	100%	Inspection Levels, S2 (AQL 1.5) as	IEC 62271-100	IEC 62271-100	Test Record		P	v	-		
		4	Contact Resistance	Major	Test	100%	per IS2500	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
			Mechanical operation	Major	Test	100%	Part-I per board	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		6	Breaker Closing/ Tripping Time	Major	Test	100%		Mfg std.	Data sheet	Test Record		P	V			
2	Vacuum		Make, Type & Rating	Major	Visual	100%		Appd. Drawing	Appd. Drawing	Test Record		P	V	-		
	Contactor along with panel	12	HV Test on Power Circuit	Major	Test	100%	Special Inspection	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		3	IR Test on Main, Auxiliary/ Control Ckt.	Major	Test	100%	Levels, S2 (AQL 1.5) as	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		4	Contact Resistance	Major	Test	100%	per IS2500	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		5	Mechanical operation	Major	Test	100%	Part-I per board	IEC 62271-100	IEC 62271-100	Test Record		P	V	-		
		6	Closing/ Tripping Time	Major	Test	100%		Supplier TC	Supplier TC	Supplier TC		V	V	-		
C.	Final Panel	As	sembly													
	Panel	1	Verification of overall dimensions and labels	Major	Meas.	100%	Special Inspection Levels, S2 (AQL 1.5) as per IS2500 Part-I per board	As per approved Layout drgs.	As per approved Layout drgs.	Mfr. Record		P	W	W	1	
		2	Measurement of tightness of busbar joints by torque wrench	Critical	Meas.	100%	5 joints / offered lot	-	40 Nm	Mfr. Record		P	W	W	 <i> </i> 	

D: \* RECORDS, INDENTIFIED WITH "TICK" (1) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. \*\* M: MANUFACTURER / SUB-SUPPLIER: C: MAIN SUPPLIER, N: N FORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.

		ITI	EM : MV Switrch	gear	INDICATIV	E QUALI	ITY PLAN			QP.NO:					REVIEWED BY	APPROVED BY
(FI	रीपीसी TPC	uļ	pto 33KV		CONFORMING IS / IEC / NTPC		SPECIFICAT	TON		Rev No.: 0 Date: VALID UPTO:						
Sl No	COMPONENT & OPERATIONS	CH	HARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM (	OF CHECK 6 C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AG M	ENG	CY N	REMARKS	!
1	2		3	4	5			7	8	9	D	**	10		11	
		3	CT /PT fixing & mounting arrangement	Major	Visual	100%	10 Samples / offered lot	Mfg. drg.	Independently mounted	Mfr. Record	*	P	W	W	Check CT pig tail f connection (i.e. che equipotential wire a CT).	ixing with busbar/ cking of fixing of applicable only for Slot
		4	Busbar Clearance Check	Major	Measurement	100%	Aat random, at 2-3 points	Mfg. drg.	Approved Drawing	Mfr. Record		P	W	W	+ ′	
		5	Functional / Operational check on Breaker/ Contactor, Operation of limit switches / Electrical Interlock Checks.	Critical	Test	100%		NTPC approved scheme & drg.	NTPC approved scheme & drg.	Mfr. Record		P	W	w		
		6	Main circuit contact Resistance Measurement (Top Busbar to Bottom Fixed Contact).	Critical	Test	100%	Special Inspection Levels, S2	IEC 62271-100/ Temp. rise test report	IEC 62271-100/ Temp. rise test report	Mfr. Record		P	W	W		
		7	Safety Shutters operation check	Critical	Mech.	100%	(AQL 1.5) as per IS2500	BHEL, Drg.	BHEL, Drg.	Mfr. Record		P	W	W		
		8	5 Close/ open operation test for CB/ Contactor	Critical	Test	100%	Part-I per board	IEC 62271-100	IEC 62271-100	Mfr. Record		P	W	w		
		9	Breaker/ Contactor Closing/ Tripping Time	Critical	Test	100%		Datasheet, mfr standard	Datasheet, mfr standard	Mfr. Record		P	W	W		
		10	Earthing of Breaker Truck / Doors	Major	Visual	100%		-	-	-		P	W	W		
		11	Circuit Breaker / Contactor alignment check while insertion to panel	Major	Visual	100%		-	-	-		P	W	 / W 	   	
			Interchangeability check for similar rating breaker trucks	Major	Mech	100%	1 of each rating	Approved drgs	Approved drgs	-		P	W	W		
		13	Overall aesthetics, finish, Paint shade, thickness, Adhesion (On outer surface).	Major	Visual/Test	100%	1 Panel / offered lot	As per NTPC spec.	As per NTPC spec.	Mfr. Record		P	W	W	Paint adhesion checusing calibrated tap	ck by cross hatch methe

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		IT	ем: MV Switrchg	gear	INDICATIV	E QUALI	ITY PLAN			QP.NO:				REVIEWED BY	APPROVED BY
			pto 33KV							Rev No.: 0					
72	क्रिकेटी   	այ	pto 551 <b>x</b> v		CONFORMING	TO CODE :				Date:					
N	TPC				IS / IEC / NTPC		SPECIFICAT	ION		VALID UPTO:					
I Mo	COMPONENT	CI	HARACTERISTICS	CLASS	TYPE OF	QUANTUM (		REFERENCE	ACCEPTANCE NORMS	FORMAT OF		AGE	VCV	' REMARKS	
1110	& OPERATIONS	CI	TARACTERISTICS	CLASS	CHECK	QUANTUM		DOCUMENT	ACCEPTANCE NORMS	RECORD	- 1 '	HOL	NC I	KEWIAKKS	
	& OF EKATIONS					6 M	6 C/N	DOCUMENT		KECOKD	N	I C		T	
1	2		3	4	5	O IVI	0 C/N	7	9	0 1		k 10		11	
1	2		3	_	3			,	o .		k .	1		11	
		14	HV test on Power & control ckt.	Critical	Test	100%		IEC 62271-200	IEC 62271-200	Mfr. Record	1	P	\ V ,	w	
		15	IR Test before & after the HV Test with 500V meggar for control circuit and 5.0KV Meggar for Power Ckt.	Major	Test	100%	Special Inspection Levels, S2	IEC 62271-200	IEC 62271-200	Mfr. Record	]	PV	V	w	
		16	Door locking arrangement	Major	Visual	100%	(AQL 1.5) as per IS2500	Internal Arc test report	Internal Arc test report	-	1	P V	۲		
		17	Degree of protection check	Major	Test	100%	Part-I	NTPC approved drgs / NTPC Spec	Paper should not come out when door is closed.	Mfr. Record	]	PV	V	Paper pulling methods Panel.	hod for IP 5X Instrur
		18	Proper Wire Dressing / Crimping	Major	Visual	100%		-	-	-	P	٧	v .	 w 	
		19	Gland plate material and thickness check	Minor	Meas.	100%		App. Drg.	App. Drg.	Mfr. Record			٧٦		
	Earthing Truck	1	Rating & Type	Major	Visual	100%		As per NTPC s	As per NTPC spec.	Mfr. Record	1	P V	۷Ίν	W	
			5 Close/ open operation test for CB/ Contactor	Major	Functional test	100%	100%	-do-	-do-	Mfr. Record		P V			
		3	Electrical interlock	Major	Functional test	100%		-do-	-do-	Mfr. Record	1	P \	٧	w	

D: \* RECORDS, INDENTIFIED WITH "TICK" (1) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. \*\* M: MANUFACTURER / SUB-SUPPLIER: C: MAIN SUPPLIER, N: N FORM W: WITNESS AND V: VERIFICATION. CHP: CUSTOMER HOLD POINT BY NTPC SHALL BE IDENTIFIED UNDER AGENCY COLUMN "N" AS 'W'.

MFC LO	GR.'s GO		ACTURER'S ND ADDRESS	ITEM TRAN	I : POTE NSFORM	NTIAL IER	MANUF	QP NO.: REV.NO DATE: PAGE: .	<b>::</b>	Y PLAN	PROJECT PACKAGI CONTRAC MAIN-SUI	E C <b>T NO.</b>				
SL. NO	COMPO	č	CHARACTERIS	STICS	CLASS	TYPE OF	OF C	ANTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF		AGE	NCY		REMARKS
110	OPERA	TIONS				CHECK	M	C/N	DOCUMENT	NORMS	RECORD	M	1	C	N	
1.	2		3.		4.	5.		6.	7.	8.	9.	D*		** 10		11.
	BOUGH	T OUT IT	TEMS													
1.1	Insulat	or	Dimension (ID,OD,P.C.D)		Major	Measure	1 sample/ Size/ lot	-	Drawing/ P.O.	Drawing/ P.O.	F01 A (8.2.4) / STC		Р	-	-	
	_		Flange Thickne	ess	DO	DO	DO	-	DO	DO	DO		Р	-	-	
	_		Creepage		DO	DO	DO	-	DO	DO	DO		Р	-	-	
	<u> </u>		Total Height		DO	DO	DO	-	DO	DO	DO		Р	-	-	_
	-		Hole Dia.		DO	DO	DO	-	DO	DO	DO		Р	-	-	
	-	-	Electrical Rout Test		DO	Test	DO	-	IS 5621 - 1980	IS 5621 - 1980	STC		V	-	-	
	<u> </u>		Temp. Cycle T	est	DO	DO	DO	-	DO	DO	DO		V	-	-	_
	-	-	Porosity Test		DO	DO	DO	-	DO	DO	DO		V	-	-	_
	-	-	Visual		DO	Physical	100%	-	Free From Damage	Free From Damage	F01 A (8.2.4) / STC		P/ V	-	-	
1.2	Supper Enamel Copper		Dimension		Major	Measure	1 sample/ Size/ lot	-	IS 13730	IS 13730	F01Y (8.2.4) / STC		P / V	-	-	
			Elongation		DO	Test	DO	-	DO	DO	DO		P/ V	-	-	
			Springness		DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
			Flexiblity & adherence		DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
										1	T					
									ICK" (√) SHALL BE		DOC. NO.:	1		RE	<u>v (</u>	CAT
								PPLIER IN QA DO	CUMENTATION. I SUPPLIER, N: NTP	PC						
MANIETT	ACTION	D/	MAIN OURS	IED					ON. AS APPROPRIATE	;	4					
MANUF SUB-SU	ACTURE	K/	MAIN-SUPPI	AEK.	CHP:	NTPC SHALI	L IDENTIFY IN	COLUM "N" AS	' W"	FOR NTPC						
30 <b>D</b> -30	LILIEN	SIGNA	TURE							USE	REVIEWED	BY	APPR	OVED BY		PPROVAL EAL

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			CTURER'S ND ADDRESS	ITEM TRAN	I : POTE NSFORM	ENTIAL IER	MANUF	QP NO.: REV.NO DATE:		Y PLAN	PROJECT PACKAGE CONTRAC MAIN-SUE	E :	· :			
SL. NO	COMPONI & OPERATIO		CHARACTERIS	STICS	CLASS	TYPE OF CHECK	-	NTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGE	1		REMARK
1.	2.		3.		4.	5.		6.	7.	8.	9.	D*		** 1	N O	11.
			Solvent Test		DO	DO	DO	_	DO	DO	STC		V		_	<del>                                     </del>
			Breakdown Vo	oltage	DO	DO	DO	-	DO	DO	F01Y (8.2.4) / STC		P / V	-	-	
			Continuty of Covering		DO	DO	DO	-	DO	DO	STC		٧	-	-	
			Resistance to abrasion		DO	DO	DO	-	DO	DO	F01Y (8.2.4) / STC		P / V	-	-	
			Resistance Measurement		DO	DO	DO	-	DO	DO	DO		P / V	-	-	
	_		Heat Shock Te	est	DO	DO	DO	-	DO	DO	DO		V	-	-	
	_		Cut Through T	est	DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
1.3	MS Tank		Dimension		Major	Measure	1 sample /Size / lot	-	Drawing/ P.O.	Drawing/ P.O.	F01(8.2. 4)		Р	-	-	
			Material		DO	Test	DO	-	DO	DO	STC		V	-	-	
			Surface Finish	ı	DO	Physical	DO	-	Free From Damage	Free From Damage	Inhouse TC		Р	-	-	
			Pressure test		DO	Test	100%	-	test@30 psi	No Leakage	DO		P/V	-	-	
1.4	Core (C.R.G.O)		Dimension		Major	Measure	1 sample /lot	-	P.O./Drg.	P.O./Drg.	F01(8.2. 4)		Р	-	-	
			Surface defect	ts	DO	Visual	DO	-	Free From Damage	Free From Damage	DO		Р	-	-	
			Weight		DO	Measure	DO	-	P.O./Drg.	P.O./Drg.	DO		Р	-	-	
	FACTURER/		MAIN-SUPPI	LIER	ESSEN ** M P: PEF	TIALLY INC : MANUFAC RFORM W: '	LUDED BY SUI FURER/SUB-SU WITNESS AND	PPLIER IN QA DO JPPLIER C: MAI	CICK" (√) SHALL BE OCUMENTATION. N SUPPLIER, N: NTI ON. AS APPROPRIATI . 'W"		DOC. NO.:			RI	EV (	AT
		IGNAT								USE	REVIEWED	BY		OVED B	SE	PPROVAL AL
ORM	AT NO.: QS	S-01-Q	AI-P-09/F1-R	21				PAG	E 2 OF 12				ENG	G. DIV	'./QA&	I



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			ACTURER'S AND ADDRESS				<b>MANUF</b>	<u>ACTURII</u>	NG QUALITY	Y PLAN	PROJECT	:				
					: POTE			QP NO.			PACKAGE	E :				
MFC LO				TRAN	SFORM	IER		REV.NO	).:		CONTRAC	T NO. :				
				SUB-S	SYSTEM	I: 33 KV O	IL FILLED	DATE: PAGE:	OF		MAIN-SUI					
SL.	COMPO	NENT	CHARACTERIS	STICS	CLASS	TYPE OF	~	ANTUM CHECK	REFERENCE	ACCEPTANCE	FORMAT OF		AGE	NCY		REMARKS
NO	OPERAT	TIONS				CHECK	M	C/N	- DOCUMENT	NORMS	RECORD	M		С	N	-
1.	2.		3.		4.	5.		6.	7.	8.	9.	D*		** 10	).	11.
1.5	Bellow (	SS)	Dimension		Major	Measure	1 sample/ Size/ lot	-	As per P.O./Drg.	As per P.O./Drg.	F01W(8. 2.4)/STC		P / V	-	-	
			Flange Thickne	ess	DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
			Flange (O.D.,P.C.D.,H	oles)	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
			Chemical composition		DO	Test	DO	-	DO	DO	STC		V	-	-	
			Leakage Test		DO	DO	DO	-	check @30psi	No leakage	F01W(8. 2.4)/STC		P / V	-	-	
1.6	Viton Ru O Ring	bber	Dimension (ID,OD,Thk)		Major	Measure	1 sample/ Size/ lot		P.O./Drg./Mfg.s td.	P.O./Drg./Mfg. std.	F01F(8.2 .4)/STC		P / V	-	-	
			Hardness		DO	Test	DO		DO	DO	DO		P / V	-	-	
			Tensile Strengt	th	DO	DO	DO		DO	DO	STC		V	-	-	
			Ultimate Elong	ation	DO	DO	DO		DO	DO	DO		V	-	-	
			Compression s		DO	DO	DO		DO	DO	DO		V	-		
			200°C for 22 H													
			Heat Resistance 250°C, 70 Hrs.	e @	DO	DO	DO		DO	DO	DO		V	-	-	
			Ageing in Transformer O		DO	DO	DO		DO	DO	DO		V	-	_	
			at 200°C for 72	2 Hrs												
			1		LECI	END. + DE	CORDS BIDES	IDIDLED MITTIE	TIGUT ( / ) GILLLI DE		DOC. NO.:			DE	V (	CAT
					ESSEN	TIALLY INC	CORDS, INDEN LUDED BY SU	PPLIER IN OA DO	TICK" (√) SHALL BE OCUMENTATION.		DOC. NO			KE	<u> </u>	.A1
					** M	: MANUFAC	ΓURER/SUB-SU	JPPLIER C: MAI	N SUPPLIER, N: NTF							
MANUF SUB-SU	ACTURER PPLIER	y/	MAIN-SUPPL	IER				V: VERIFICATI COLUM "N" AS	ON. AS APPROPRIATE 'W"	FOR NTPC	1					
		SIGNA	TURE		7					USE	REVIEWED	BY	APPR	OVED B	Y AI	PPROVAL

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PAGE 3 OF 12

REVIEWED BY

APPROVED BY

APPROVED BY

SEAL

ENGG. DIV./QA&I



			ACTURER'S AND ADDRESS				MANUF		NG QUALITY	Y PLAN	[	PROJECT	:				
	GR.'s DGO			ITEM: TRANS	SFORM	IER		QP NO. REV.NO DATE:	0.:			PACKAGE CONTRAC	T NO. :				
					YSTEM		IL FILLED	PAGE:	OF	•		MAIN-SUP	PLIER:				1
			Change in Vol	ume	DO	DO	DO		DO	DO		DO		V	-	-	
L. IO	COMPORAL COMPORACION COMPORAL COMPORACION COMPORAL COMPORAL COMPORAL COMPORAL COMPORAL COMPORAL COMPORACION COMPORAL COMPORACION		CHARACTERIS	STICS	CLASS	TYPE OF	OF C	NTUM CHECK	REFERENCE DOCUMENT	ACCEPT A NORM		FORMAT OF RECORD		AGE	NCY		REMARK
	OPERAL	HUNS				CHECK	M	C/N				RECORD	M		C	N	
1.	2.		3.		4.	5.		6.	7.	8.		9.	<b>D</b> *		** 10		11.
			Change in Hardness		DO	DO	DO		DO	DO		DO		V	-	-	
			Change in Ten Strength	sile	DO	DO	DO		DO	DO		DO		V	-	-	
			Change in Elongation		DO	DO	DO		DO	DO		DO		V	-	-	
			Density		DO	DO	DO		DO	DO		DO		V	-	-	
. 7	Insulatin Crepe Pa		Dimension Thickness	N	Major	Test	1sample/I ot	-	PO/Mfg.std./Tec h. Data sheet	PO/Mfg.st		F01R (8.2.4)/S TC		P / V	-	-	
			Grammage/Sunce	ıbsta	DO	DO	DO	-	IS 9335/IEC 60554	IS 93357 6055		DO		P / V	-	-	
			Tensile Streng (MD)	th	DO	DO	DO	-	DO	DO		DO		P/ V	-	-	
			Elongation at (MD)	Break	DO	DO	DO	-	DO	DO		DO		P / V	-	-	
			Conductivity of Extract	f aq.	DO	DO	DO	-	DO	DO		DO		P/ V	-	-	Max. 5
			Ph of aq. Extra	act	DO	DO	DO	-	DO	DO		DO		P/ V	-	-	ERDA tes result onc
			Ash Content		DO	DO	DO	-	DO	DO		DO		P/ V	-	-	in half yearly
			Moisture Cont	ent	DO	DO	DO	-	DO	DO		DO		P/ V	-	-	
					LEGE	END: * RE	CORDS, INDEN	TIFIED WITH "	TICK" (√) SHALL BE			DOC. NO.:			RE	V	CAT
				TED.	ESSEN** M:	TIALLY INC : MANUFAC	LUDED BY SUF TURER/SUB-SU	PPLIER IN QA D PPLIER C: MAI	OCUMENTATION. IN SUPPLIER, N: NTF ION. AS APPROPRIATE	7							
	FACTURER JPPLIER		MAIN-SUPPI	JER				COLUM "N" AS		FOR NTPO	C						
	9	SIGNA	TURE							USE		REVIEWED I	3Y	APPR(	OVED BY		PPROVAL

SEAL ENGG. DIV./QA&I FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 4 OF 12



		UFACTURER'S E AND ADDRESS  Hill Count	INDIC ITEM: POTI TRANSFORM SUB-SYSTEM	ENTIAL MER		QP NO.: REV.NO DATE: PAGE: .	<b>::</b>	Y PLAN PO/Mfg. std.	PROJECT PACKAGE CONTRAC MAIN-SUE	E : CT <b>NO.</b> :		-	_	
SL. NO	COMPONENT & OPERATIONS	CHARACTERIS	TICS CLASS	TYPE OF CHECK	_	NTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	М	AGE	NCY C	N	REMARKS
1.	2.	3.	4.	5.		6.	7.	8.	9.	D*		** 1	<u>l</u> 0.	11.
1.8	Insulating Kraft Paper	Dimension (Thickness)	Major	Test	1sample/l ot	-	PO/Mfg.std./Tec h. Data sheet	PO/Mfg.std./Te ch. Data sheet	F 01 L (8.2.4)/S TC		P / V	-	-	
		Substance	DO	DO	DO	-	IS 9335/IEC 60554	IS 9335/IEC 60554	DO		P / V	ı	-	
		Density	DO	DO	DO	-	DO	DO	DO		٧	-	-	
		Tensile Index	DO	DO	DO	-	DO	DO	DO		P / V	1	-	
		Tear Index	DO	DO	DO	-	DO	DO	STC		V	-	-	ERDA test
		Elongation	DO	DO	DO	-	DO	DO	F 01 L (8.2.4)/S TC		P / V	1	-	result once in half yearly
		Ash Content	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
		Moisture Conte	nt DO	DO	DO	-	DO	DO	DO		P / V	ı	-	
		Ph Value	DO	DO	DO	-	DO	DO	DO		P / V	ı	-	
		Conductivity	DO	DO	DO	-	DO	DO	DO		P / V	-	-	Max. 5

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" ( √ ) SHALL BE		DOC. NO.:	REV	CAT
		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,				
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL
						SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 5 OF 12 ENGG. DIV./QA&I



	GR.'s GO		ACTURER'S AND ADDRESS	ITEN TRA	A : POTE NSFORM	ENTIAL MER	MANUF	QP NO. REV.NO DATE:		Y PLAN	PROJECT PACKAGE CONTRAC MAIN-SUI	E C <b>T NO.</b>				
SL. NO	COMPO & OPERA	:	CHARACTERI	STICS	CLASS	TYPE OF CHECK	`	ANTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGE	1		REMARKS
					4					0		N		С	N	11
1.	2.	•	3. Electrical Stre	nath	4.	5.		6.	7.	8.	9.	D*	P /	** 1	).	11.
			in Air	ngui	DO	DO	DO	-	DO	Min. 7kv/mm	DO		V	-	-	
1.9	Copper	Lugs	Dimension		Major	Measure	1 sample/ Size/ lot	-	P.O. / Drawing	P.O. / Drawing	F01C(8.2 .4)/STC		P/ V	-	-	
			I.D. & Hole D barrel	ia. of	DO	DO	DO	-	DO	DO	DO		P / V	-	-	Cu. Purity Test from 3rd Party NABL Approved Lab
			Conductivity		DO	Test	DO	-	As per IACS	97.0 % Min.	DO		P/ V	-	-	
			Cu purity test		DO	DO	DO	-	As per IS 191	99.90 % Min.	Lab Report		V	-	-	
1.10	Semi Conduc Black cr		Thickness		Major	Measure	1sample/l ot	-	Mfg.std./Tech. Data sheet	Mfg.std./Tech. Data sheet	F01 F (8.2.4)/ STC		P / V	-	-	
	paper	СРС	Width		DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
			Substance		DO	DO	DO	-	DO	DO	DO		P/ V	-	-	
			Tensile Streng	gth	DO	Test	DO	-	DO	DO	DO		P / V	-	-	
			Elongation at	Break	DO	DO	DO	-	DO	DO	DO		P / V	-	-	
	<u> </u>				ESSEN	TIALLY INC	LUDED BY SU	PPLIER IN QA D	TICK" (√) SHALL BE OCUMENTATION. IN SUPPLIER, N: NTF	PC PC	DOC. NO.:			RI	EV (	
	FACTUREI PPLIER	R/ SIGNA	MAIN-SUPPI	LIER	P: PEI	RFORM W: V	WITNESS AND		ION. AS APPROPRIATE		REVIEWED	BY	APPRO	OVED B		PPROVAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1

PAGE 6 OF 12

ENGG. DIV./QA&I



		ANUFACTURER'S AME AND ADDRESS	ITEM: TRANS	POTE SFORM	NTIAL IER	MANUF.	QP NO.: REV.NO DATE:		Y PLAN	PROJECT PACKAGE CONTRAC MAIN-SUF	CT NO. :				
SL. NO	COMPONE & OPERATIO	CHARACTER	RISTICS C	CLASS	TYPE OF CHECK	-	NTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
										ILLOUILL	M	C		N	
1.	2.	3.		4.	5.		6.	7.	8.	9.	D*	**	10.		11.
1.11	Aluminium Crepe Pape	Lhicknoss	N	Major	Measure	1 sample/lot	-	Mfg.std./Tech. Data sheet	Mfg.std./Tech. Data sheet	F01R(8.2 .4) / STC		P / - V -		-	
		Width		DO	DO	DO	-	DO	DO	DO		P / -		-	
		Substance		DO	DO	DO	-	DO	DO	DO		P / -		-	
		Tensile Strer	ngth	DO	Test	DO	-	DO	DO	DO		P / -		-	
		Elongation a	t Break	DO	DO	DO	-	DO	DO	DO		P / -		-	
SL. NO	COMPONE &	CHARACTER	CISTICS C	CLASS	TYPE OF	_	NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF		AGENCY			REMARKS
140	OPERATIO	ONS			CHECK	M	C/N	DOCUMENT	NORWIS	RECORD	M	С	:	N	
1.	2.	3.		4.	5.		6.	7.	8.	9.	D*	**	10.		11.
1.12	Transforme Oil	er Appearance	N	Major	Visual	1 sample/lot	-	IEC 60296	Oil Shall be Clear	F01(8.2.		P / -		_	
		D	200	D.O.	T4	DO		500	& Transparent	4) /STC		•	_		
		Density @ 20 Kinematic viscosity@ 4		DO DO	Test DO	DO DO	<u>-</u>	DO DO	Max. 0.895 Max. 12	STC DO		V -		<u>-</u>	
		Pour Point D		DO	DO	DO	-	DO	Max.(- 40)	DO		V -		-	
MANUF SUB-SU	FACTURER/	MAIN-SUP	PLIER	ESSEN** M: P: PER	TIALLY INC : MANUFAC' RFORM W: V	LUDED BY SUP TURER/SUB-SU WITNESS AND	PLIER IN QA DO PPLIER C: MAII	TICK" (√) SHALL BE DCUMENTATION. N SUPPLIER, N: NTI ON. AS APPROPRIATI 'W"		DOC. NO.:			REV	(	EAT

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 7 OF 12 ENGG. DIV./QA&I

SIGNATURE



REVIEWED BY

APPROVED BY

APPROVAL SEAL

FOR NTPC USE

		IANUFAC AME AND	TURER'S O ADDRESS	ITEM TRAN	: POTE SFORM	NTIAL IER	MANUF	QP NO REV.I DATE	NO.:	Y PLA	N	PROJECT PACKAGE CONTRAC MAIN-SUE	E :				
SL. NO	COMPONI & OPERATIO	C	HARACTERIS	STICS	CLASS	TYPE OF CHECK	OF (	ANTUM CHECK	REFERENCE DOCUMENT		PTANCE RMS	FORMAT OF RECORD		AGE	NCY		REMARK
	OPERATION	ONS				CHECK	M	C/N				RECORD	M	1	С	N	
1.	2.		3.		4.	5.		6.	7.		8.	9.	D*	ļ.,,	** 10	0.	11.
		W	later content		DO	DO	DO	-	DO	Max.20	) mg/Kg	DO		V	-	-	
			DV ( New nfiltered)		DO	DO	DO	-	DO	Mir	n. 30	F01(8.2. 4) /STC		P/ V	-	-	
		D	DF @90ºC		DO	DO	DO	-	DO	Max.	0.001	DO		P/ V	-	-	
		Pa	article Count		DO	DO	DO	-	DO	No ge	n. Req.	STC		V	-	-	
			eutralization alue/Acidity		DO	DO	DO	-	DO	Max	. 0.01	DO		V	-	-	
		In	nterfacial Ten	sion	DO	DO	DO	-	DO		n. 40 /mtr	DO		٧	-	-	
			otal Sulpher ontent		DO	DO	DO	-	DO	Max.	0.15%	DO		V	-	-	
		Co	orrosive Sulp	her	DO	DO	DO	-	DO		orrosive	DO		V	-	-	
		Di	ibenzyl Disul <sub>l</sub>	phide	DO	DO	DO	-	DO	Not De 5mg/kg		DO		V	-	-	
			ntioxidant dditives,		DO	DO	DO	-	DO	0.08 -	0.40 %	DO		V	-	-	
		М	etal Passivato	or	DO	DO	DO	-	DO	Not De 5mg/kg	•	DO		V	-	-	
		Fu	urfural Conte	nt	DO	DO	DO	-	DO	Not Det.( </td <td>0.05mg</td> <td>DO</td> <td></td> <td>V</td> <td>-</td> <td>-</td> <td></td>	0.05mg	DO		V	-	-	
		af St	il Charactersi fter Oxidatior tability test @ 20°C for 500	) D						- 3/							
					<u>L</u> EGI	END: * RE	CORDS, INDE	NTIFIED WITH	I "TICK" (√) SHALL BE			DOC. NO.:			RF	EV (	CAT
					ESSEN ** M	TIALLY INCI : MANUFACT	LUDED BY SU FURER/SUB-SU	PPLIER IN QA JPPLIER C: M	DOCUMENTATION. IAIN SUPPLIER, N: NTP ATION. AS APPROPRIATE	,							
	FACTURER/ JPPLIER		MAIN-SUPPL	IER	-		LIDENTIFY IN			FC	DR ΓPC						
	SI	IGNATU	JRE							US	SE	REVIEWED	BY	APPRO	OVED B	Y Al	PPROVAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1

PAGE 8 OF 12

ENGG. DIV./QA&I



	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFAC	CTURING QUALITY PLAN	PROJECT :
		ITEM: POTENTIAL	QP NO.:	PACKAGE :
MFGR.'s		TRANSFORMER	REV.NO.:	CONTRACT NO
LOGO			DATE:	CONTRACT NO. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: OF	MAIN-SUPPLIER:

SL. NO	COMPONENT &	CHARACTERISTICS	CLASS	TYPE OF	OF C	NTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF		AGE	NCY		REMARKS
110	OPERATIONS			CHECK	M	C/N	DOCUMENT	NORWIS	RECORD	M		C	N	
1.	2.	3.	4.	5.		6.	7.	8.	9.	D*		** 10	).	11.
		Total acidity	DO	DO	DO	-	IEC 60296	Max. 0.3 mgKOH/gm	STC		V	-	-	
		Total sludge	DO	DO	DO	-	DO	Max. 0.05%	DO		V	-	-	
		DDF @90 Deg.C	DO	DO	DO	-	DO	Max. 0.05	DO		V	-	-	
		Gassing tendency @50Hz	Major	Test	1 sample/lot	-	IEC 60296	0 - 5	STC		V	-	-	
		Flash Point PMCC,Deg.C	DO	DO	DO	-	DO	Min. 135°C	DO		V	1	-	
		PCB Content	DO	DO	DO	-	DO	Not Det.(< 2mg/kg)	DO		V	-	-	
		PCA Content	DO	DO	DO	-	DO	Max. 3%	DO		V	-	-	
		Carbon Type analysis												
		Cn%	DO	DO	DO	•	DO	Min. 45	DO		V	-	-	
		Cp %	DO	DO	DO	=	DO	Max. 49	DO		V	-	-	
		Ca %	DO	DO	DO	•	DO	Max. 6	DO					
2.0	INI E	DOOFCC INCRECTION												
2.0		PROCESS INSPECTION												
2.1	Testing before	Turn Ratio	Major	Test	100%	-	IS 3156	IS 3156	P.C.C		Р	-	-	
	assembly	High Voltage power frequency test @ 3kv	DO	DO	DO	-	DO	DO	DO		Р	-	-	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE		DOC. NO.:	REV	CAT
		ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.  ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC				
MANUFACTURER/	MAIN-SUPPLIER	P: PERFORM W: WITNESS AND V: VERIFICATION. AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR			
SUB-SUPPLIER		CIII. NIFC SHALL IDENTIFT IN COLOM IN AS W	NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL
						SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 9 OF 12 ENGG. DIV./QA&I



			ACTURER'S AND ADDRESS	I	NDIC	ATIVE	MANUF		IG QUALIT	Y PLAN	PROJECT	· :	:			
	GR.'s			TRA	M : POTE NSFORM	1ER		QP NO.: REV.NO DATE:	<b>.:</b>		PACKAGI CONTRAC	CT NO.				
				SUB-	-SYSTEM	1: 33 KV O	IL FILLED	PAGE: .	OF		MAIN-SUI	PPLIER	:			
SL. NO	COMPO &		CHARACTERIS	STICS	CLASS	TYPE OF	_	ANTUM CHECK	REFERENCE	ACCEPTANCE	FORMAT OF		AGE	ENCY		REMARKS
NO	OPERAT	TIONS				CHECK	M	C/N	DOCUMENT	NORMS	RECORD	М	[	С	N	]
1.	2.		3.		4.	5.		6.	7.	8.	9.	D*		** 1	0.	11.
			Accuracy test determination errors accordi the requireme of appropriate accuracy class (20% rate vol & polarity test	of ng to ents e atge)	DO	DO	DO	-	DO	DO	DO		Р	-	-	
			Final accuracy	<u> </u>	DO	DO	DO	-	DO	DO	DO		Р	-	-	
2.2	Assen	mbly	Visual Inspect Fitment of Secondary Terminals	ion &	Major	Test	100%	-	IS 3156	IS 3156	P.C.C		Р	-	-	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE		DOC. NO.:	REV	CAT
		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.				
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

DO

DO

DO

Drg./Mfg.std.

Free From

Damage

FORMAT NO.: QS-01-QAI-P-09/F1-R1 **PAGE 10 OF 12** ENGG. DIV./QA&I

H. V. @ 3KV (primary neutral to earth)

Polarity test

Fitment of

Insulators Tank cleanliness &

Painting

I.R. Measurement

DO

DO

DO

DO

DO

DO

DO

DO

Physical

DO

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DO

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DO



DO

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DO

Drg./Mfg.std.

Free From

Damage

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	MANUFACTURER'S NAME AND ADDRESS	INDICATIVE MANUFAC	CTURING QUALITY PLAN	PROJECT	:
MECh.		ITEM: POTENTIAL	QP NO.:	PACKAGE	:
MFGR.'s LOGO		TRANSFORMER	REV.NO.: DATE:	CONTRACT NO	0. :
		SUB-SYSTEM: 33 KV OIL FILLED	PAGE: OF	MAIN-SUPPLIE	CR:

SL. NO	COMPONENT &	CHARACTERISTICS	CLASS	TYPE OF	_	ANTUM CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF	AG	SENCY		REMARKS
110	OPERATIONS			CHECK	M	C/N	DOCUMENT	NORMS	RECORD	M	C	N	
1.	2.	3.	4.	5.		6.	7.	8.	9.	D*	**	10.	11.
		Secondary H.V. Test(Secondary terminal to earth)	DO	Test	DO	-	IS 3156	IS 3156	DO	Р	-	-	
2.3	Vacuum Drying &	Leakage check after assembly	Major	Test	100%	-	test@30psi	No leakage	P.C.C.	Р	-	-	
	Oil Impregnation												
		Oil Test Before filling	DO	DO	1sample/l ot	-	IEC 60296	IEC 60296	DO	Р	-	-	
		Tan Delta @ 90°C & B.D.V				-							
		DGA	DO	DO	Randomly	-	IEC 60599	IEC 60599	Test report	Р	-	-	
		Oil Level check (After filling)	DO	Physical	100%	-	Drg./Mfg.std.	Drg./Mfg.std.	P.C.C.	Р	-	-	
	If applicable	Fitment of Bellow	DO	DO	DO	-	Drawing	Drawing	DO	Р	-	-	
		Bellow Pressing	DO	DO	DO	-	1.2Kg/cm <sup>2</sup>	No Leakage	DO	Р	-	-	
		Final Height of Bellow	DO	DO	DO	-	As per Drawing	As per Drawing	DO	Р	-	-	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE		DOC. NO.:	REV	CAT
		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.				
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 11 OF 12 ENGG. DIV./QA&I



N REM.  N 1  W W  W	** 10.		D*	FORMAT OF RECORD	CCEPTANCE NORMS 8.	REFERENCE AC DOCUMENT	NTUM HECK	-	TYPE				
). 1 W	** 10.				8.		C/N	OF C	OF CHECK	CLASS	CHARACTERISTICS	OMPONENT & PERATIONS	SL. NO
w w	w	P	D*	9.	8.	7.					3.	2.	
W		Р					6. IEW TYPE TEST		5.	4.	INSPECTION		1.
W		Р				CLEARANCE.	IEW TYPE TEST	RIO TO REV					3.0
	W			Test	op.Drg./GTP	App.Drg./GTP Ap	1 Sample	1 Sample	Measure	Critical	Visual & Dimension Check	ROUTINE TEST	
w		Р		Test	pp.Drg./GTP	App.Drg./GTP Ap	1 Sample	1 Sample	Measure	Critical	Oil leakage test.		
	w	Р		DO	S 3156/IEC 61869	IS 3156/IEC IS 61869	100%	100%	Test	DO	Verification of Terminal marking & Polarity		
w	w	Р		DO	DO	DO	DO	DO	DO	DO	Power Frequency voltage withstand Test on Primary winding		
w	w	Р		DO	DO	DO	DO	DO	DO	DO	Power Frequency voltage withstand Test on Secondary winding		
w	w	Р		DO	DO	DO	DO	DO	DO	DO	Induced over voltage withstand test		
w	w	Р		DO	DO	DO	DO	DO	DO	DO	Determination of errors		
w	w	Р		DO	DO	DO	DO	DO	DO	DO	Capacitance & Tan delta @10 k.v. & Um/√3		
w	w	Р		Test	pp.Drg./GTP	App.Drg./GTP Ap	1 Sample	1 Sample	Measure	Critical	Oil Test (BDV,Tan Delta, Sp. Res, Moisture)		
V CAT	REV			DOC. NO.:			PLIER IN QA DO	LUDED BY SUF	TIALLY INC	ESSEN			
Y APPROVA		ADD	DV/	ремемер	FOR NTPC	N. AS APPROPRIATE,		WITNESS AND	RFORM W: V	P: PEI	MAIN-SUPPLIER	IER	MANUF SUB-SUI
RE	w		BY	Test	pp.Drg./GTP	App.Drg./GTP Ap  CK" (√) SHALL BE  CUMENTATION.  SUPPLIER, N: NTPC  N. AS APPROPRIATE,	1 Sample TIFIED WITH "TI PLIER IN QA DO PPLIER C: MAIN V: VERIFICATIO	1 Sample  CORDS, INDEN LUDED BY SUF TURER/SUB-SU VITNESS AND	Measure  END: * RE  TIALLY INC: : MANUFACT  RFORM W: V	Critical  LEG ESSEN ** M P: PEI	Capacitance & Tan delta @10 k.v. & Um/√3 Oil Test (BDV,Tan Delta, Sp. Res, Moisture)	IER	

APPROVED BY APPROVAL SEAL ENGG. DIV./QA&I FORMAT NO.: QS-01-QAI-P-09/F1-R1 **PAGE 12 OF 12** 



13

	FGR.'s .OGO		UFACTURER'S E AND ADDRESS		GE ARREST	OR G	TURING OP NO.: REV.NO.: OATE: PAGE: OF	QUALITY		PROJECT PACKAGE CONTRACT MAIN-SUPP	3				
SL. NO	COMPON & OPERAT		CHARACTERISTIC	S CLASS	TYPE OF CHECK	-	NTUM HECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		A(	GENC	Y N	REMARKS
1.	2.		3.	4.	5.	(	i.	7.	8.	9.	D *		**	10.	11.
1	Zinc Oxid Blocks	le	a) Visual Examination b) Energy Capability to c) Residual Voltage To d) Line discharge class test e) High current test f) Thermal stability tes g) Watt loss or resistiv current	est Critical Critical Critical Critical Critical Critical	Physical  Electrical Electrical Electrical Electrical Electrical	100% 100% 100% 3Samples / batch 3Samples / batch 3Samples / batch	100% 100% 100% 3Samples / batch 3Samples / batch 3Samples / batch 3Samples / batch	IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4	IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4 IEC 60099-4	TC / Inspection Records	~ ~ ~ ~~~	P P P P	V V V V	V V V V V	
2	Porcelain Bushing		a) Major Dimensions b) Visual Examination c) Porosity Test d) Electrical Routine Test e) Temp. Cycle Test	Major Major Major Critical Major	Physical Physical Physical Elect. Physical	2Samples/lot 100% 2Sample/lot 100% 2Samples/lot	2Samples/lot 100% 2Sample/lot 100% 2Samples/lot	Supplier Drg. IS: 5621- 1980 IS: 5621- 1980 IS: 5621- 1980 IS: 5621- 1980	Supplier Drg. IS: 5621-1980 IS: 5621-1980 IS: 5621-1980 IS: 5621-1980	TC / Inspection Records T.C. T.C. T.C.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	P P V V	V V V V	V V V V	Lot mentioned in this RQP refers to batch quantity offered for inspection by supplier.

ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.  ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC  PERFORM W: WITNESS AND V: VERIFICATION, AS APPROPRIATE,  CHECK OF THE PROPERTY OF THE PROPER	
SUB-SUPPLIER CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"  NTPC	
SIGNATURE USE REVIEWED BY APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 1 OF 7 ENGG. DIV./QA&I



		JFACTURER'S E AND ADDRESS	INDICA	ATIVE M	IANUFAC	TURING	QUALITY	PLAN	PROJECT		:			
мі	FGR.'s		ITEM: SUR	GE ARREST		QP NO.:			PACKAGE		:			
	OGO		SUB-SYSTE	M:	- 1	REV.NO.: DATE: PAGE: OF		- 1	CONTRACT MAIN-SUPP					
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTIC	S CLASS	TYPE OF CHECK	~	NTUM HECK C/N	REFERENCE DOCUMENT	ACCEPTANCI NORMS	FORMAT OF RECORD		A	GENC	Y	REMARKS
	OPERATIONS				M	C/N	1	TKU	RECORD	ļ.,,	M	C	N	
1.	2.	3.	4.	5.		6.	7.	8.	9.	<b>D</b>		**	10.	11.
3	Aluminium Castings for S.A – Ends	a) Major Dimensions b) Visual Examination c) Tensile test on Test bar d) Chemical Analysis	Major Major Major Major	Physical Physical Mech. Mech.	2Samples/lot 100% 1Sample for every lot of 2000kgs of cast alloy	UF	Supplier drg. ASTM B-85 ASTM B-85/ BS: 1490 ASTM B-85/ BS: 1490	Supplier drg. ASTM B-85 ASTM B-85/ BS: 1490 ASTM B-85/ BS: 1490	T.C.	\ \	P P V			
4	Sealing Rings	a) Dimensions b) Hardness (Shore A) c) Compression set d) Ageing Test	Major Major Major Major	Physical Mech. Mech.	2Samples/lot 2Samples/lot 2Samples/lot 2Samples/lot	2Samples/lot 2Samples/lot 2Samples/lot 2Samples/lot	Supplier drg. DIN 53505 ASTM 2000 (D 395) ASTM 2000 (D 573)	Supplier drg. DIN 53505 ASTM 2000 (D 395) ASTM 2000 (D 573)	TC / Inspection Records T.C.	< <<	P P V	V V V	V V V	
5	Pressure Release Diaphragm	a) Visual Check b) Dimensions c) Pressure Test	Major Major Major	Physical Physical Mech.	100% 1Sample/lot 1Sample/lot	100% 1Sample/lot 1Sample/lot	ITP-INW-9B Supplier drg. ITP-INW-9B	ITP-INW-9B Supplier drg. ITP-INW-9B	TC / Inspection Records	<b>√</b>	P P P	v	v	
				OS, INDENTIFIED				DOC. NO.:				REV.	CAT	
	JFACTURER/ UPPLIER	MAIN-SUPPLIER	** M: N P: PERF	MANUFACTURE ORM <b>W</b> : WITN	ED BY SUPPLIER R/SUB-SUPPLIEI ESS AND V: VE NTIFY IN COLUM	R C: MAIN SUPP RIFICATION. AS	LIER, N: NTPC	FOR NTPC						
50 <b>D-</b> 3		ATURE						USE	REVIEWED BY	7	A	PPRO	VED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 2 OF 7 ENGG. DIV./QA&I



		INDICA	ATIVE M	IANUFAC	CTURING	QUALITY	PLAN	PROJECT	1				
.'s D		S. C. B. S.			REV.NO.: DATE:								
OMPONENT & PERATIONS	CHARACTERISTI	CS CLASS	TYPE OF CHECK	OF (	CHECK	REFERENCE DOCUMENT	ACCEPTANCI NORMS	Or		I			REMARKS
2.	3.	4.	5.			7.	8.		D			N	11.
ading Rings Corona Rings	b) Dimensions	Major	Physical Physical Mech.			ITP- INW-22 / 22A Supplier drg. IS: 733	TTP- INW-22 22A Supplier drg. IS: 733		*	P P V			
ounters	a) Visual Inspection b) Counter Operation	Major Critical	Physical Elect.	100% 100%		Manufacturer Std0 Manufacturer Std0	Std0	Inspection	√	P P			
illie- nmeters	a) Insulation resistan b) Comparison test c) H.V Test	ce Critical Critical Critical	Elect. Elect. Elect.	3 Samples/lot 100% 2 Samples/lot		Manufacturer Std Manufacturer Std Manufacturer Std	Std Manufacturer Std	Inspection Records	√ √ √	P P P			
	NATURE	ESSENTI ** M: N P: PERF	ALLY INCLUDE MANUFACTURE ORM W: WITN	ED BY SUPPLIER R/SUB-SUPPLIE ESS AND V: VE	R IN QA DOCUME R C: MAIN SUPP ERIFICATION. AS M "N" AS'W"	NTATION. LIER, N: NTPC APPROPRIATE,	FOR NTPC USE	DOC. NO.:	,			D BY	CAT  APPROVAL SEAL
O P P C C C C C C C C C C C C C C C C C	MPONENT & ERATIONS  2.  ding Rings or a Rings  inters  TURER/ JER  SIG	MPONENT & CHARACTERISTIC  2. 3.  ding Rings b) Dimensions c) Tensile Strength tensions c) Tensile Strength tensions b) Counter Operation b) Counter Operation b) Comparison test c) H.V Test  TURER/ MAIN-SUPPLIE	MPONENT & CHARACTERISTICS CLASS  MPONENT & CHARACTERISTICS CLASS  2. 3. 4.  ding Rings or ona Rings or ona Rings  a) Visual Examination b) Dimensions c) Tensile Strength test Major  a) Visual Inspection b) Counter Operation  a) Insulation resistance b) Comparison test c) H. V Test Critical Critical Critical Critical  TURER/  MAIN-SUPPLIER  SIGNATURE  LEGEN  ESSENTI ** M: N P: PERF  CHP: N	MPONENT & CHARACTERISTICS CLASS TYPE OF CHECK  2. 3. 4. 5.  ding Rings or Dimensions c) Tensile Strength test Major Major Major Mech.  a) Visual Inspection b) Counter Operation Major Critical Elect.  a) Visual Inspection Domination Major Physical Major Mech.  a) Visual Inspection Major Critical Elect.  b) Counter Operation Critical Elect.  c) H.V Test Critical Elect.  LEGEND: * RECORD ESSENTIALLY INCLUDE ** M: MANUFACTURE P: PERFORM W: WITN CHP: NTPC SHALL IDE.	NAME AND ADDRESS   SUB-SYSTEM:   SUB-SYSTE	NAME AND ADDRESS   ITEM: SURGE ARRESTOR   QP NO.: REV.NO.: DATE: PAGE: OF CHECK   OF CHECK   M   C/N	NAME AND ADDRESS   TITEM: SURGE ARRESTOR   QP NO.: REV.NO.: DATE: PAGE: OF	NAME AND ADDRESS   ITEM: SURGE ARRESTOR   OP NO.;   REV.NO.;   DATE:   PAGE OF	TITEM: SURGE ARRESTOR SUB-SYSTEM:    CHARACTERISTICS   CLASS   TYPE OF CHECK   DOCUMENT   DOCUMENT	Substitute   Sub	NAME AND ADDRESS   CITEM   SURGE ARRESTOR   CP NO.:   REV.NO.: DATE:   PAGE: OF   MAIN-SUPPLIER:	THE SURGE ARRESTOR OP NO.: SUB-SYSTEM:    PACKAGE CONTRACT NO.	NAME AND ADDRESS   ITEM: SURGE ARRESTOR   OP NO.: REV.NO.: DATE: PAGE: OF

			FACTURER'S AND ADDRESS	INDIC	ATIVE M	ANUFAC	TURING	<b>QUALITY</b>	<b>PLAN</b>	<b>PROJECT</b>		:			
	ace.	TVI LIVIES	THE PRESS	ITEM: SUF	RGE ARREST		OP NO.:			PACKAGE		.:			
	FGR.'s OGO						REV.NO.:			CONTRACT	FNC	5			
	000			SUB-SYSTE	EM:		OATE: PAGE: OF			MAIN-SUPE	V W				
	COMPON	TENTE.					ALM SERVICE ALCOHOLOGICAL	••••	70	FORMAT	LIE	A.			
SL.	COMPON &	ENI	CHARACTERISTIC	CS CLASS	TYPE OF	QUAN OF CI		REFERENCE	ACCEPTANC	E FORMAT OF		A	GENC	Y	REMARKS
NO	OPERATI	IONS			CHECK	M	C/N	DOCUMENT	NORMS	RECORD		M	С	N	
1.	2.		3.	4.	5.	6	•	7.	8.	9.	D *		**	10.	11.
IN PR	ROCESS IN	SPECT	TON FOR SURGE	ARRESTORS				1			1				
									_ 1						
			a) Visual check	Major	Visual	Physical test	. N	Sample	IEC 60099-4 IEC 60099-4			P P			
			b) Seal leak Test		Measurement	N.		Sample	IEC 60099-4			Р			
1	Assembly							0	11						
-	Surge Arr	esters			1										
TELNIA	LINCDEC	TION	PECENIC												
FINA	L INSPEC	HON &	& TESTING			223									
			\T' 10D' '		DI : 10		w Type Test (		0 1: 1	0.1/00	1 /1	ъ	T * 7		
			<ul><li>a) Visual &amp;Dimension</li><li>b) Reference Voltage</li></ul>		Physical Electrical	100% 100%	100% 100%	Supplier drg IEC 60099-4	Supplier drg IEC 60099-4	QA/QC Records	$\sqrt{}$	P P	V V	V V	
			c) Residual voltage	Critical	Electrical	100%	100%	IEC 60099-4	IEC 60099-4		V	P	v	v	
			d) Leakage current	Critical	Electrical	100%	100%	IEC 60099-4	Manufacturer	:	$\sqrt{}$	P	V	V	
	Surge Arr	esters	@MCOV e) P.D. Test	Critical	Electrical	100%	100%	IEC 60099-4	Std		2/	P	v	v	
Α	Routine To		f) Sealing Test	Major	Physical	100%	100%	IEC 60099-4	IEC 60099-4		Ž	P	V	V	
			g) Verticality check of	on Major	Physical	1Sample/lot	1Sample/lot	IEC 60099-4	IEC 60099-4			P	V	V	
			completely assemb	oled	-	_			Deviation in						
			surge Arrester						verticality – no						
			(If Applicable)						to exceed 10 m	m					
					ND: * RECORD					DOC. NO.:				REV.	CAT
					IALLY INCLUDE MANUFACTURE										
MANI	JFACTURE	R/	MAIN-SUPPLIER	P: PERF	ORM W: WITNE	SS AND V: VEF	RIFICATION. AS		FOR						
	UPPLIER			CHP: N	TPC SHALL IDEN	TIFY IN COLUM	"N" AS 'W"		NTPC						
		SIGNA	ATURE						USE	REVIEWED BY	Y	A	PPRO	VED BY	APPROVAL SEAL
ORM	IAT NO.:	OS-01-	QAI-P-09/F1-R1	I			PAGE 4 O	F 7				ŀ	ENGG	. DIV./Q	

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	FGR.'s .OGO	UFACTURER'S E AND ADDRESS		RGE ARREST		CTURING  QP NO.:  REV.NO.:  DATE:  PAGE: OF		Y PLAN	PROJECT PACKAGE CONTRACT MAIN-SUPP				
SL. NO	COMPORAL COMPORT COMPO	CHARACTERISTIC	S CLASS	TYPE OF CHECK	_	ANTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCI NORMS	FORMAT OF RECORD	М	AGENC C	Y N	REMARKS
1.	2.	3.	4.	5.		6.	7.	8.	9.	D *	**	10.	11.
В	Surge Mo Routine T	a) Visual Examination b) Dimensions c) i) Counter Operation test ii) Ammeter Operation test d) Seal leak test	Major	Physical Physical Electrical Electrical Physical	100% 3 Samples/lo 100% 100%	100% 3 Samples/lot 100% 100%	IEC 60099-4 Supplier drg.	Manufacturer Std Supplier drg.  Manufacturer Std  Manufacturer Std  Manufacturer Std	Records	$\begin{array}{ccc}  & P \\  & P \\  & P \\  & P \\  & P \\ \end{array}$	V V V	V V V V	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" ( √ ) SHALL BE		DOC. NO.:	REV	CAT
MANAGE CONTROL	MANN GYPRY WER	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,	FOR			
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNA	ATURE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 5 OF 7 ENGG. DIV./QA&I



	FGR.'s OGO	UFACTURER'S E AND ADDRESS		ATIVE M RGE ARREST EM:	OR C	TURING  OP NO.: REV.NO.: OATE: PAGE: OF		]	PROJECT PACKAGE CONTRACT MAIN-SUPP		2			
SL. NO	COMPON & OPERATI	CHARACTERISTICS	S CLASS	TYPE OF CHECK	-	NTUM HECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		A M	GENCY	Y N	REMARKS
1.	2.	3.	4.	5.	6		7.	8.	9.	D *		**	10.	11.
		a) Visual &Dimensions b) Reference Voltage to	3	Physical Electrical	Cube root of qty. offered Cube root of	Cube root of qty. offered Cube root of	Apprd Drgs IEC 60099-4	Apprd Drgs IEC 60099-4	QA/QC Records	√ √	P P	W W	W W	
		c) Residual voltage tes	t Critical	Electrical	qty. offered Cube root of	qty. offered Cube root of	IEC 60099-4	IEC 60099-4		V	P	W	W	
		d) P.D. Test e) Galvanizing Test	Critical	Electrical	qty. offered Cube root of qty. offered	qty. offered Cube root of qty. offered	IEC 60099-4	IEC 60099-4			P	W	W	
		i) Uniformity of Zir Coating.	Major	Measurement / chemical	1sample / lot	1sample / lot	IS: 3070/2633	IS: 3070/2633			P	W	W	
С	Surge Arra Acceptanc Tests	ii) Weight of Zinc Coating.	Major	Measurement / chemical	1sample / lot	1 sample / lot	IS:3070/ 6745	IS:3070/6745		V	P	W	W	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE		DOC. NO.:	REV	CAT
MANUFACTURER/	MAIN-SUPPLIER	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 COLUM "N" AS 'W"	FOR			
SUB-SUPPLIER		CIII. NITE SHALL IDENTIFT IN COLOM IN AS W	NTPC			
SIGNAT	URE		USE	REVIEWED BY	APPROVED BY	APPROVAL
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FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 6 OF 7 ENGG. DIV./QA&I



	IFGR.'s LOGO			RGE ARREST	OR	CTURING QP NO.: REV.NO.: DATE: PAGE: OF	QUALITY	TO	ROJECT ACKAGE ONTRACT IAIN-SUPP					
SL. NO	COMPON & OPERAT	CHARACTERISTICS	CLASS	TYPE OF CHECK	-	NTUM CHECK C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	1	A M	GENC C	Y N	REMARKS
1.	2.	3.	4.	5.	. 1	6.	7.	8.	9.	D *		**	10.	11.
D	Surge Mo Acceptand Tests	a) Visual Examination b) Dimensions c) i) Counter operation test at 100A & 10KA, 8/20 µ sec. ii) Ammeter operation test	Major Major Critical Critical	Physical Physical Electrical Electrical	Cube root of qty. offered Cube root of qty. offered Cube root of qty. offered Cube root of qty. offered	Cube root of qty. offered Cube root of qty. offered Cube root of qty. offered Cube root of qty. offered	IEC 60099-4	Manufacturer Std  Supplier drg.  Manufacturer Std  Manufacturer Std	QA/QC Records	\ \ \ \	P P P	W W W	W W W	

		<b>LEGEND:</b> * RECORDS, INDENTIFIED WITH "TICK" ( √ ) SHALL BE		DOC. NO.:	REV	CAT
		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.				
MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER	CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS 'W"	FOR NTPC			
SIGNAT	TURE		USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 PAGE 7 OF 7 ENGG. DIV./QA&I



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				Е		Е				正
☐ Availability of QA& QC manpower and laboratory		-	A	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. D	)rawings	SR	V	
<ul> <li>Sampling for testing of bulidi materials, concrete mix desig etc.</li> </ul>		As agreed / required	А	Physical	As specified in FQP for various materials	Tech Specs and Const. D	Prawings	SR/TR	V	Test report along with the recommendations from specialist agency to be submitted to NTPC.
C Submission of schedule of tests to be done monthly / quaterly		-	A	Physical	Once prior to start of work and thereof monthly	Tech Specs and Const. D	Prawings	SR	V	
<ul> <li>Stacking and storage of construction materials and components at site</li> </ul>		As per IS:4082	A	Physical	Random	Tech Specs and Const. D 4082	Prawings and IS:	SR	V	
	Nature, type of soil/rock before and during excavations	As agreed / required	С	Visual	Random in eah shift	Tech Specs and Const. D	Prawings	SR		
	Initial ground level before start of excavations	As agreed / required	С	Measurement	100%	Tech Specs and Const. D	Prawings	SR	<b>V</b>	
	Final shape and Dimensions of excavations.	As agreed / required	С	Measurement	100%	Tech Specs and Const. D	Prawings	SR		
	Final excavation lelvels	As agreed / required	В	Measuement	100%	Tech Specs and Const. D		SR	√	
	Side slope of final excavation	As agreed / required	В	Measurement	Random in each shift	Tech Specs and Const. D	rawings	SR		
at odird creater Tect	Optimum moisture content and max. dry density before fill	As per IS: 2720, Proctor needle apparatus,etc.	В	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.VII), Tech Sp Drawings	ecs and Const.	SR/TR	V	
Maintare antest	Moisture content of fill before compaction	As per IS: 2720, balance, oven, rapid moisture meter, etc.	В	Physical	One in every 10000 cum for each type and source of fill materials	IS 2720 (Pt.II), Tech Spec Drawings	cs and Const.	SR/TR	1	
eree Comoution										
i	Dry density by core cutter method OR	As per IS: 2720/compaction test (core cutter), balance, rapid moisture meter	A	Physical	One sample for every 10000 SQM area for each compacted layer.	IS 2720 (Pt. XXIX), Te Const. Draw OR	ings	SR/TR	V	
	Dry density in place by sand displacement method	etc.				IS 2720 (Pt. XXVIII), 7 Const. Draw				

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	MOTOCOLO COMONT										
	CHAICHAI	Physical & Chemical Properties	as per IS:4031	Α	Testing	At Random	As per relevant IS	Codes/ Tech	TR	V	Each consignment of cement shall be duly
		rnysical & Chemical Properties	as per 10.4031		resung	At Nandoni	Specification	Codes/ Tech		V	correlated with manufactureres TC. One sample from each lot shall be tested for stetting time and compressive strength. If cement is stored more than 60 days in godown of contractor same shall be retested for comp. Strength & setting time.
	Corpe correcte	Moisture content	as per IS:2386	В	Physical	Once for each stack of 100 Cu.M. or part there of			SR/LB	<b>V</b>	During monsoon when this has to be done every day before start of concreting
ii		Specific gravity, water absorption	IS:2386	А	Physical	Once for each source & for every change of source	IS: 2386 Part-III, IS:383/Tech Spec	IS:456,	SR/LB/ TR	<b>V</b>	
iii		Sieve analysis, flakiness index, elongation index,	IS:2386	В	Physical	One per 100 cum., or part thereof	IS: 2386 Part-I, Spec	IS:383/Tech	SR/LB	<b>V</b>	
i□		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	A	Physical	Once per source/ on every change of source	IS: 2386 Part-II, Spec	IS:383/Tech	SR/LB/ TR	<b>V</b>	
		Soundness	IS:2386	А	Physical	-do-	IS: 2386 Part-V, IS:383		SR/LB/ TR	<b>V</b>	
□		Crushing value abrasion value and impact value	IS:2386	Α	Physical	-do-	IS:383, IS-2386 Part IV/T	ech Spec	SR/LB/ TR	<b>V</b>	
	ile										
i		Moisture content, water absorption	balance , oven, rapid moisture meter etc	В	Physical	To be done every day before start of work	IS: 2386 Part-III	IS:383	SR/LB/T R	<b>V</b>	
ii		Deleterious materials (coal & lignite, clay lumps, material finer than 75 micron sieve, soft fragment, shale)	IS:2386	A	Physical	Once per source& for on every change of source	,		SR/LB/T R	1	
iii		All other tests similar to coarse aggregates as mentioned above.					IS-2386, IS-383		SR/LB/T R	1	except test for flankiness index, elongation index, abrasion value, impact value
	□ □ter							-			
i		Complete tests as per IS:456	Buret, conical flask, pipette etc	В	Testing	One for each source.	IS:3025 part 22 and 23 (f ), IS:456(for acceptance of		SR/LB/T R	<b>√</b>	

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	CONCOTO				_	_					
i	Sanouara	Crushing strength (works Tests cubes)	IS:516	A	Physical	One set of 6 cubes per 50 CuM or part thereof for each grade of concrete per shift whichever is earlier.	IS:516, IS:456, NTPC Tech. Spec.		SR/LB/ TR	1	Min. of 6 cubes for each mix, 3 specimen shall be tested at 7 days remaining 3 shall be for 28 days comp. Strength.
ii		Workability - slump test	IS:1199	В	Physical	At the time of concrete pouring at site every two hrs	IS:456/NTPC Tech. Spec.	;	SR/LB/T R	1	
C10000	admintare air Coorete	Type of admixture	As per IS:9103	В	Review of MTC	For each lot received at site	Designed mix and IS:9103		MTC	V	Admixture of appd. Brand and tested quality shall be used (each lot of admixture will included with brochure in which the type of admixture and its properties shall be clearly indicated)
	Coorete coored										
i		mixing of concrete shall be done in a approved mixer such as to produce a homogenous mix				To be calibrated at the time of starting and subsequently once in three months, and shall conform to IS:4925	Review of calibration chart/ Certific 4926	cate, IS		1	
ii		Arrangement for transportation & placement of concrete.	As required	С	Visual	100%	Before clearance for concreting		Inspectio n Report	V	
iii		Handling and Transportation of concrete	As required	С	Physical	100%	As per construction/erection method (to be approved one week prior to s		SR		
i□		Placement of concrete	Visual	В	Physical	100%	As per construction/erection method and tech.specs / No segregation	dology	SR	V	
		Compacting	As required	С	Physical	At Random	IS:456		SR	<b>√</b>	
□		Curing	As required	С	Physical	At Random	Period of curing as per IS 456 (use bags / curing compound)	e gunny	SR	√	
	TOTICOCO NOCCOTOC	CT INN C.NTN.									
i		Dimensional check on finished structures & Dimensional tolerances	As required	В	Measurement	Approved Drawing	As per IS:456/ tech. Specification.		SR/LB	V	
ii		Water Tightness Test of liquid retaining structure/ tanks	As required	В	Test	100%	IS:3370/ Tech. Specification		SR/LB	1	
	ON OCMONT TOOL										
i		Physical and Chemical Properties for each lot as per relevant IS codes	As required/ agreed	А	Review of MTC	Each batch of delivery	IS : 1786, IS:432, IS:1566, Tech Sp and Const. Drawings	pecs	MTC	<b>√</b>	Applicable if steel is procured by Contractor

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ii		Freedom from cracks surface flaws, Lamination.	As agreed / required	С	Visual	Random in each shift	IS: 1852, IS:432, IS:1786, Tech Specs and Const. Drawings		SR		To be checked at site. Steel collected from source should be free from excessive rust. To be stored as per Technical Specs.
	PLOCOMONT OF TOUR	I MONTOTOOL									Teormodi opeda.
		Bar bending schedule with necessary		В	Visual &	Random in each shift	Approved Drawings, Tech	Cnoon and	SR	-	1
		lap, Spacers & Chairs	As agreed / required		Measurement		Const. Drawings, IS:2502			√	
ii		Bending of bars, cutting tolerance	As agreed / required	С	Visual & Measurement	Random in each shift	Approved Drawings, Tech Specs and Const. Drawings, IS:2502		SR	<b>V</b>	
III		Acceptance - Cover, spacing of bars, spacers and chairs after the reinforcement cage is put inside the formwork	As agreed / required	В	Visual & Measurement	Random in each shift	Approved Drawings, Tech Const. Drawings	Specs and	SR	<b>V</b>	
	T == N = N = == M =										
i		Materials and accessories	As agreed / required	С	Visual	Once before start of work	As per relevant IS, Tech S Const. Drawings	Specs and	SR		
ii		Soundness of staging, shuttering and scaffolding including application of mould oil / release agent	As agreed / required	С	Visual	Once before start of work	As per manufacturer's spe 3696,4014, 4990, Tech S Drawings		SR		
III		Acceptance of formwork before start of concreting		В	Physical / visual	Before start of each concreting	As per provisions and tole Specs and Const. Drawing		SR	V	
	□ MP P□ □ □ C□ □ □ □						Tech Specs and Const. I	Drawings			
i		Material - Hot bitumen and water proofing materials etc	As agreed / required	В	Review of MTC	Each batch of delivery at site	Tech Specs and Const. [	Orawings, IS 702	SR	<b>V</b>	
ii		Acceptance of damp proof course	As agreed / required	В	Acceptance	100%	Tech Specs and Const. I	Drawings	SR		
	000 <b>T</b> N0										
i		Material	As agreed / required	В	Review of MTC	Each batch of delivery	Tech Specs and Const. D	rawings	SR	1	
		Type of mix - fluid mix, plastic mix, stiff mix etc.	As agreed / required	С	Physical	Prior to start of work	Tech Specs and Const. D	rawings	SR	<b>V</b>	
ii		Mixing, placement, application and grout pressure	As agreed / required	С	Physical	Random in each shift	Tech Specs and Const. D	rawings	SR		
iii		Compressive strength	As agreed / required	С	Physical	Random in each shift	Tech Specs and Const. D	rawings	SR	<b>V</b>	
i		Acceptance of the grouts	As agreed / required	В	Physical	Each grout section	Tech Specs and Const. D	rawings	SR		
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ш	Teut uu uriuuu	Dimensions shape compressive		В	Measurement/	As per relevant IS Code/			Inspectio		Efflorescence shall be checked at each
		Dimensions , shape, compressive strength, water absorption, warpage, efflorescence.	As agreed / required	В	Physical Test				n Report	<b>V</b>	source.
	Mrtrti	Workmanship, verticality and alignment	As agreed / required	В	Visual/ Physical	100%	IS 2212, IS 1905 , Tech S Drawings	Specs and Const.	SR/LB		
							ŭ				
	PLOTONO DO MONO	T							SR	<del>                                     </del>	
•		Curing	As agreed / required	С	Physical	100%	Tech specifications, cons drawings and agreed met		SK		
ii		Thickness and finishing of plaster, grooves etc	As agreed / required	В	Visual/ Measurement	Random in each shift	Tech Specs and Const. D	rawings	SR/LB		
iii		Truness of plastering system	As agreed / required	В	Visual/ Physical	Random in each shift	Tech Specs and Const. D	rawings	SR		
	0000 <b>T</b> (No 0 <b>N</b> 0 0 <b>T</b> 000 0 0										
i	Materials and accessories- Oil Bound, Acrylic Emulsion,	Shade, type from brand and		В		Each batch of delivery	- 10 10 10		SR/MTC	,	
	Chemical Resistant, Oil Resistant Paint etc.	manufacturer as approved by NTPC EIC	As agreed / required		Review of MTC		Tech Specs and Const. D	Prawings		1	
ii	Surface prepration	As required	As agreed / required	С	Physical /visual	Random in each shift	Tech Specs and Const. I	Drawings	SR		
iii	Acceptance of painted surfaces	As required	As agreed / required	В	Physical	Each surface at random	Tech Specs and Const. D	Prawings	SR		
	PONTING CONTON COTOCL		TooL 0 00000								
i		Paining Materials and accessories	-	В	Review of MTC	Each batch of delivery	Tech Specs and Con	st. Drawings	SR/MTC	<b>√</b>	
ii		Surface prepration	As agreed / required	С	Physical /visual	Each Erection Mark	Tech Specs and Con- Relevant code/si		SR	<b>√</b>	
iii		Primer Thickness	Elcometer	С	Measurement	Each Erection Mark	Tech Specs and Con	st. Drawings	SR	√	
i□		DFT of paint	Elcometer	С	Measurement	Each Erection Mark	Tech Specs and Con		SR	V	
		Acceptance of painted surfaces	Elcometer	В	Visual and measurement	Each Erection Mark	Tech Specs and Con	st. Drawings	SR		
	O OTOO POODONO										
		Methodology for the application of water proofing system	As required	В	Review	for each type of treatment	Tech Specs and Const. I	Drawings	SR	<b>√</b>	
		_									
i	Graded under bed	Levels / slopes	As required	С	Physical	100%	Tech Specs and Const. I	Drawings			
	Elastomaric coatings	Material- Primer coat, finishing coat	As required	В	Review of MTC	Each lot of delivery	Tech Specs and Const. I		SR	V	

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	Е				Е	Е					
III	Wearing course	Materials - PCC, chicken wire mesh, elastomeric sealant	As required	В	Review of MTC	Each lot of delivery	Tech Specs and Const. [	Drawings	SR	√	
i		Acceptance of water proofing work	As agreed / required	В	Physical	100%	Tech Specs and Const. D	rawings			
	ecico ad otec										
	PVC coated chain link fencing,			В		Each batch of delivery			SR/MTC		
i	Welded wire mesh (IS 1566), Reinforced barbed tape galvanised (IS 2629) etc.	Materials	As agreed / required		Review of MTC	·	Tech Specs and Const. D	Prawings		<b>V</b>	MTC shall contain all the parameters specified in the technical specifications / relevant IS Codes
ii		Acceptance of the installation	As agreed / required	В	Physical / measurements	Each installation	Tech Specs and Const. D	Orawings	SR		
		0 0 0 0 0 0									
	Cement Courete contribu										
i		Glass/ PVC strips in joints	As agreed / required	С	Physical	Random in each shift	Tech Specs and Const. D	rawings	SR		
ii		Finishing and acceptance	As agreed / required	В	Physical	100%	Tech Specs and Const. D	)rawings	SR		
	Tie	g and acceptance	9		,	100,0					
i	Cermi itriled		As agreed / required	В	Review of MTC	Each lot of delivery	Tech Specs and Const. D	Orawings	SR	<b>V</b>	MTC shall contain all the parameters specified in the technical specifications / relevant IS Codes
ii		Finishing and acceptance	As agreed / required	В	Physical	100%	Tech Specs and Const. D	rawings	SR		
	ot toe roite od Mar	e			-						
i		Quality, texture, thickness, colour for each lot of delivery from approved source	As agreed / required	С	Physical	Each batch of delivery	Tech Specs and Const. D	Orawings	SR	<b>V</b>	
ii		Finishing and acceptance	As agreed / required	В	Physical	100%	Tech Specs and Const. D	)rawings	SR		
	O OTOO OOPPLO OOONTOOO	N-T-LL-T-N-									
	ter and dittions and dist	re□									
i	Materials	GI/ MS pipes and fittings	As agreed / required	В	Review of MTC	Each lot of delivery as per Specifications	Tech Specs and Const. I	Drawings	SR	√	
ii	Disinfection	Before use	As agreed / required	С	Physical	Each installation	Tech Specs and Const. [	Drawings	SR		
iii	Hydraulic test	Before use / leakage	As agreed / required	В	Physical	Each installation	Tech specs and const dra	awings	SR	√	
i		Acceptance and working	As agreed / required	Α	Acceptance	Random	Tech Specs and Const. D	)rawings	SR		
	ood oot iroo oot iroo dee	9□						-	<u> </u>		
i	M⊡teri⊡	SCI / CI pipes and fittings / joints	As agreed / required	В	Review of MTC	Each lot of delivery as per Specifications	Tech Specs and Const. D	)rawings	SR	<b>V</b>	
ii		Acceptance and leakage	As agreed / required	В	Physical	Random	Tech Specs and Const. D	)rawings	SR		
"	1	planes and loakage	ag. coa / roquirou		, 01001				1		1

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		Sanitory items and fixtures i.e. water closets, urinals, wash basins, sinks,							SR		
		mirrors, shelves, towel rail, soap		_		Each lot of delivery as	T 10 10 15			,	
'	M⊡teri□□	containers, geyser, water cooler, etc,	As agreed / required	В	Physical	per Specifications	Tech Specs and Const. [	Orawings		√	
		water supply / sanitation pipes, manhole cover and frames etc									
,,		Acceptance of installations of all	As agreed / required	В	Acceptance	100%	Tech Specs and Const. [	)rawings	SR		
"		sanitory items and fixtures	As agreed / required	ь	Acceptance	10076	reon opecs and collst. L	Ziawiiiya			
	-00 Pi		l		1		1				<u> </u>
	□CC Pi□e□		T						OD		
						Each lot of delivery as			SR		
i	Material	RCC pipes	As agreed / required	В	Review of MTC	per Specifications	Tech Specs and Const. [	Orawings /IS 458		√	
li ii		Acceptance and leakage	As agreed / required	В	Physical	Random	Tech Specs and Const. [	Drawings	SR		
	□ ter true Tuu	- total primited and total and total	_ ···· ag· ···· / ··· / a···· ·		,			<u> </u>			
									SR		
i	Material	Over head / loft type	As agreed / required	В	Physical	Each lot of delivery as per Specifications	Tech Specs and Const. [	Orawings		<b>√</b>	
				_							
	PCUL TOMO	Aceptance and leakage	As agreed / required	В	Acceptance	Random	Tech Specs and Const.	Drawings	SR		
	ortoico Mat orcoodico cos	tem□									
	Material	Earthing mat		В		Each lot of delivery as	As per relevant IS and Te	ach Space /	SR/MTC		
	iviaterial	•	As agreed / required	Ь	Physical	per Specifications	Manufacturer's, IS 3043	зсп. оресэ /	SIVIVITO	√	
ii		Weld sizes & length	Visual/Tape	В	Visual/ Measurement	100%	Tech Specs and Const. [	Drawings			NTPC approved electrodes shall be used
iii		D P test	DP test Kit	В	Physical	10% at random of the offered lot	Tech Specs and Const. [	Drawings	TR	√	
i		Earth test	Earthing test kit	А	Physical	100%	Tech Specs and Const. [	Drawings,	SR	<b>√</b>	
	000000000										
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į i		Standard proctor Test to determine		Α	Physical	One in every 2000 cum	1		SR/TR	√	
		optimum moisture content and max. dry density	Proctor needle apparatus, etc.			for each type and source of fill materials					
		Moisture content of fill before		В	Physical	One in every 2000 cum	1		SR/TR		
"		compaction	As per IS: 2720, balance, oven etc.		,	for each type and source of fill materials			3.0		
iii		Dry density by core cutter method	As per IS:	Α	Physical	One in every 500 SQM	1		SR/TR	<b>√</b>	
		OR	2720/compaction test			area for each compacted					
		Dry density in place by sand displacement method	(core cutter), balance etc.			layer.					

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i		Gradation	As required / agreed	В	Physical	One test per 200 cum of aggregate			SR	<b>V</b>	
=		Atterberg Limit	As per IS: 2720	В	Physical	One test per 200 cum of aggregate			SR	V	
<b></b>		Moisture content prior to compaction	As per IS: 2720	В	Physical	One test per 250 SQM of aggregate			SR	V	
i□		Density of compacted layer	As per IS: 2720	А	Physical	One test per 500 SQM of aggregate	As per Technical Speci /IRC/MOR1		SR / TR	<b>V</b>	
		Deleterious constituents	As required / agreed	В	Physical	As required			SR	1	
П		CBR	As per IS: 2720	В	Physical	As required			SR / TR	<b>V</b>	
	ter and Mand m Nac	itomi oo oo									
i		Aggregate Impact value	Agrregate Impact value Test Apparatus	A	Physical	One test per 200 cum of Test aggregate			SR	<b>V</b>	
ii		Grading	Set of IS Sieves	В	Physical	One test per 100 cum of aggregate			SR		
iii		Flakiness index and elongation index	Flakiness test gauge	В	Physical	One test per 200cun of agregate			SR		
i□		Atterberg Limits of binding material	Atterberg limits determination	Α	Physical	One test per 25 cum of binding material			SR	<b>V</b>	
		Atterberg Limits of portion of agreggate passing 425 micron sieve	Atterberg limits determination	Α	Physical	One test per 100cum of aggregate			SR	<b>√</b>	
	itimiaaa araai aa aa ee	r ded remi ret de e									
i		Quality of binder	Penetrometre with St. needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as applicable			SR	√	
ii		Aggregate Impact Value / Los angeles abrasion value	Aggregate Impact ValueTest apparatus	А	Physical	One test per 50 cum of aggregate			SR	V	
iii		Flakiness Index and elongation indexof aggregates	Flakiness test gauge	В	Physical	One test per 50 cum of aggregate			SR		
io		Stripping value of aggregate (Immersion tray test)	As required / agreed	В	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.	As per Technical Specii /IRC/MORT		SR		

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		Water absorption test		A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.			SR	1	
i i		Water sensitivity of mix	As required / agreed	A	Physical	Initialy one set of 3 representative specimen per source, and on every change of source.			SR	٧	
Ξij		Grading of aggregates	Set of Sieves	В	Physical	One test per 25 cum of aggregates			SR		
□iii		Soundness ( Magnesium and Sodium Sulphate)	As required as per IS:2386	A	Physical	Once per source by each method and on every change of source			SR	V	
i		Polished stone value	As required as per BS:812(Part 114)	В	Physical	As required			SR		
		Temperature of binder at application	Thermometer	В	Physical	At regular close intervals			SR		
ū		Binder content	Bitumen extractor	A	Physical	One test per 500 cum& not less than two tests per day			SR	1	
⊐ii		Rate of spread of materials	As required / agreed	В	Physical	One test per 500 cum and not less than 2 tests per day	As per Technical Speci /IRC/MOR		SR		
□iii		Percentage of fractured faces	Bitumen extractor	A	Physical	When gravel is used one test per 50cum of aggregates			SR	V	
	T C C Prime C C										
i		Quality of binder	Penetrometre with Standard needle	A	Physical	No. of samples per Lot & tests as per IS:73, IS:217, IS:8887 as applicable			SR	<b>V</b>	
ii		Temperature of binder at application	Thermometer	В	Physical	At regular close intervals			SR		
iii		Rate of spread of binder	As required / agreed	В	Physical	One test per 500 cum and not less than 2 tests per day			SR		

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		Horizontal alignment, Surface levels		В	Physical	As per section 900 of	As per Technical Specifi	ications/ BOQ/	SR		
		and Surface regularity	As required / agreed			MORTH specification	Referred Standards and drawings	d construction			
		Rectification	As required / agreed	В	Physical	Each rectification	As per Technical Specifi Referred Standards and drawings		SR	V	
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i	Procured by contractor	Structural steel procured from NTPC approved sources- Mechanical (YS, UTS, Elg, UT if specified),,and Chemical properties (CE as per IS)		A	Review	For each batch of each section delivered at site	Technical Specification a Drawings, IS 2		SR	V	Correlated MTC shall be verified.
		enemical properties (e2 de per 10)									
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						5 1 1 1 1 5			14/00		HT. 1
i		Welding Procedure Specification * (WPS:)	-	A	Review	Each Welding Process	Technical Specification a Drawings, ASME-IX/		WPS	√	*To be approved by CQA
ii		PQR and Welder's Qualification	-	Α	Physical	Each welder	PQR/ WQR, AWS-D1.1/A	SME-IX,	TR	√	
iii		Welding consumables	-	В	Physical	Random in each shift	Approved WPS, Latest N7	TPC	SR	√	
		Modeling and Cutting		В	Visual &	Fook plate/Conting	Technical Specification a	ad Canata sation	SR		
•		Marking and Cutting	Tape, ruler etc	Ь	Measurement	Each plate/ Section	Drawings/ Approved		SK.		
ii		Match markings for trial assembled components	-	В	Physical	Each fit-up	Technical Specification a  Drawings	nd Construction	SR		
iii		Weld Fit Up- Edge Preparation/ Gap/ Alignment	Tape, ruler etc	В	Physical	Each fit-up	Technical Specification a Drawings, IS 7		SR	<b>V</b>	If required suitable stiffners shall b provided to prevent deflection.
	Don contikin more			1						1	
	P == ===TiN= ====er ===	Pre-Heating Temperature		В	Measurement	Each pre-heating			SR	1	
•		Tre-ricating remperature	Thermal chalk		Wedsurement	Lacii pre-ileating	Technical Specification a Drawings, Approv		ÖK	√	
II		Post Weld Heat Treatment (PWHT), if required	Thermo couple with time temperature recorder	А	Time & Temperature	Each PWHT	Technical Specification a Drawings, Approv		SR	1	
						<u> </u>					
i		Sequence of welding	-	В	Physical	Random in each shift	Technical Specification a Drawings, Agreed		SR		
II		Removal/ grinding of temporary attachments		В	Measurement	All cleats/ attachments	Technical Specification a Drawings, Approved Drg.	nd Construction	SR		
iii		Completeness after welding- Dimensions/ distortion	Weld gauge	В	Visual	Each structure component	Technical Specification a Drawings, IS		SR	√	

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i□		Completeness of welding (each butt & fillet weld)		В	Visual	Each structure component	Technical Specification a Drawings, Approved Drg.	nd Construction	SR	√	
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	OILLOT O OLOO										
-		size and visual examination	As required/ agreed	В	Visual/ Measurement	100%	As per technical speci construction drawings, IS		SR		As per requirement of NTPC Engineer
II		Dye Penetration Test	As required/ agreed	В	Physical	5% of Weld length with min. 300mm at each loaction	As per technical speci construction drawings, 1.1		SR		
	00 <b>TT</b> 0 0 <b>L</b> 00										
i		Visual examination	As required/ agreed	В	Visual	Random in each shift	As per technical spectonstruction drawings,		SR		As per requirement of NTPC Engineer
ii		DPT	As required/ agreed	В	Physical	100% on all butt welds after back gouging on root run and 10% on final weld.	As per technical speci construction drawings, 1.1		IR		All butt welds to be back gouged befor DPT
III		Radiography Test	As required/ agreed	А	Physical	10%	As per technical spec construction drawings, 1.1		IR	<b>V</b>	Wherever RT is not feasible UT to b carried out. In case of failure of any weld in SPOT/RT or UT the % of retesting shabe doubled at that particular loactior Acceptance criteria of NDT on welds shabe as per AWS D1.1.
	OOONOOTIIN COOCOO										
i		Dimensions and levels- Shape, lines (including diagonal checks)	Theodolite, Tape etc	В	Physical/ Measurement	Each Foundation	Tech Specs and Const. D	rawings	SR	<b>V</b>	
ii		Foundation Bolts and Embedments- Verticality, Levels, pitch distance	Theodolite, Tape, Piano wires etc	В	Physical/ Measurement	Each Foundation	Tech Specs and Const. D	rawings	SR	<b>V</b>	
	POINTING COUTOM			-		<del> </del>	-				
i	FLORIDAL DUDILIM	Paining Materials and accessories	-	A	Review of MTC	Each batch of delivery	Tech Specs and Const. D	rawings	SR/MTC	<b>V</b>	Mfr.'s T.C. shall be correlated with the consignment received.
ii		Submission of painting methodology	-	В	For Review of painting system	Before start of painting work	Tech Specs and Const. D				
iii		Surface prepration	As agreed / required	В	Physical /visual	Each Erection Mark	Tech Specs and Const. D		SR	<b>V</b>	
i 🗆		Primer Thickness	Elcometer	В	Measurement	Each Erection Mark	Tech Specs and Const. D		SR	√,	
		DFT of paint Acceptance of painted surfaces	Elcometer Elcometer	B B	Measurement Visual and measurement	Each Erection Mark Each Erection Mark	Tech Specs and Const. D Tech Specs and Const. D		SR SR	√	
i	PoomooMoLo CooCoo	Punch Erection marks and match marks on members	-	В		Each structural member	Tech Specs and Const. D	rawings			Markings for - Assembly designation, Part number Weight, Any other importar

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ii		Pre-assembly as per match mark	-	В	Visual/ Physical	Each structural member	Tech Specs and Con	st. Drawings			
III		Camber, sweep and total length after trial assembly of structure.	Theodolite, Tape, plumb, piano wires etc	В	Visual/ Physical	Each structural member	Tech Specs and Con	st. Drawings	SR	<b>V</b>	
i□		Control assembly check at shop	Theodolite, Tape,	В	Visual/ Physical	Every first and tenth set of identical structure	Tech Specs and Con	et Drowings			
			plumb, piano wires etc			or identical structure	rech specs and con	ist. Drawings			
		Completion of primer & intermediate coat of paint		В	Visual / Physical	Random	Tech Specs and Con	st. Drawings	SR		
	OCTON COOCOO	1									
i		Alignment, slopes, level, tolerances of erected member	Theodolite, Tape, plumb, piano wires etc	В	Measurement	Each structural member	Tech Specs and Const. D	Prawings	SR	<b>V</b>	
ii		Tightening of bolts/ Torque including foundation bolts with lock nuts	Wrench/ Torque wrench if specified	В	Visual/ Physical	Each structural member	Tech Specs and Const. D	)rawings	SR	<b>V</b>	
III		Completion of all erection fillet & butt welds		В	Visual	Each structural member	Tech Specs and Const. D	)rawings	SR	<b>V</b>	
i		Acceptance of erected structure	Theodolite, Tape, plumb, piano wires etc	В	Visual/ Physical	Each erected structure	Tech Specs and Const. D 7215 and IS 12843	Prawings, IS	SR	<b>V</b>	
	POMONONT COLTO NO N	TN									
i		Material- Permanent mild steel Bolts, mild steel Nuts, High strength structural Bolts, Washers-Dimensions, properties, Class, storage along with MTC	Screw gauge, Vernier, Tape etc.	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. D	Prawings	SR/MTC	<b>V</b>	
ii		Contact surfaces before bolting	-	В	Physical	Random before asembly for bolting	Tech Specs and Const. D 4000	Orawings, IS	SR		
iii		Inspection of the assembled bolts	-	В	Physical	Randomly in each shift for assembeled bolts	Tech Specs and Const. D 4000	Prawings, IS	SR		
i		Tensioning	As agreed / required	В	Physical	Randomly during snug tight test and after full tensinoning	Tech Specs and Const. D 4000	Prawings, IS	SR	<b>V</b>	
		Acceptance of installed bolts	-	В	Physical	Each bolt	Tech Specs and Const. D	)rawings	SR		
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□□N□	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD			GEN		REMARKS	
			1			6 M	6 C/N	DOCOMENT					С			
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	□ □□ M teri □		□□□□t □□t Item	ıC⊡e□											Steel to be procured approved Main Steel	
		а	Chemical composition	Major	Chemical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product				٧	Р	V	-	аррготов ман отос	Troductio.
		b	Tensile Test (TS,YS, % Elongation	Major	Mechanical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product	NTPC and or a	NTPC   OCID   OF	Mfr. Test Certificate	٧	Р	٧	-		
	trate	С	Bend Test	Major	Mechanical	1 sample/ 40 MT or part thereof for each class of product	1 sample/ 40 MT or part thereof for each class of product	(1) (1) (1) (1)	(10)(10)(10)		<b>V</b>	Р	٧	-		
	oro Pote	d	Visual Check for surface finish	Major	Visual	100%	100%				<b>V</b>	Р	٧	-		
		е	Dimension	Major	Measure											
		i)	For angle-Leg- length, out of squareness, camber-weight			As Per IS:2500 SSP Level-I AQL	As Per IS:2500 SSP Level-I			TR	<b>√</b>	P	V	V		
		ii)	For Bars- Diameter, Ovality			SSP Level-I AQL	AQL	mP	P	IK						
		iii)	For Plates:- Thickness, Weight													
															1	
	nico		Chemical composition	Major	Measure	One sample/Lot	One sample/Lot	IS: 209	IS:209, Zn-99.95%	Producers' TC/ Check Test report	<b>√</b>	Р	V	٧		available. Check e produced from

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	OPERATIONS	011	THO TETRIOTICO	OLINOO	CHECK	6 M	6 C/N	DOCUMENT	ACCEL TANCE NOTING	RECORD		М	С	N		
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	N P C C N	PI	CT II N													
								IS:802-P-II		Fabricator's						
	oortoer	a)	Straightening	Major	Visual	100%	100%	Approved drgs Shop Sketches	IS:802-P-II	inspection Report.	-	Р	V			
							1st Piece &	IS:802-P-II		Fabricator's						
		b)	Cropping (cutting)	Major	Visual	1st Piece & every	every 50th	Approved drgs	IS:802-P-II	inspection	-	Р	V			
		,	3 (**** 3)	.,		50th Piece	Piece	Shop Sketches		Report.						
								A 1 1 /	A 1 1 /	Fabricator's						
		c)	Stamping	Major	Visual	100%	100%	Approved drgs/	Approved drgs/	inspection	-	Р	٧			
		ľ						NTPC Spec.	NTPC Spec.	Report.						
			Making hala by			1st Piece & every	1st Piece &			Fabricator's						
		d)	Making hole by punching /drilling	Major	Measure	50th Piece	every 50th	IS:802-P-II	IS:802-P-II	inspection	-	Р	٧			
			punching /aniling			50th Piece	Piece			Report.						
						1st Piece & every	1st Piece &			Fabricator's						
		e)	Edge Security	Major	Measure	50th Piece	every 50th	IS:802-P-II	IS:802-P-II	inspection	-	Р	٧			
						Journ leve	Piece			Report.						
			Hole to Hole			1st Piece & every	1st Piece &			Fabricator's						
		f)	distance	Major	Measure	50th Piece	every 50th	IS:802-P-II	IS:802-P-II	inspection	-	Р	V			
			diotarioo			001111000	Piece			Report.						
		١.	Overall length of			1st Piece & every	1st Piece &			Fabricator's		_	l			
		g)	members	Major	Measure	50th Piece	every 50th	IS:802-P-II	IS:802-P-II	inspection	-	Р	V			
							Piece			Report.				_		
			O Pata			1st Piece & every	1st Piece &	10 000 D II	10 000 B II	Fabricator's		Р	.,			
		n)	Gauge distance	Major	Measure	50th Piece	every 50th	IS:802-P-II	IS:802-P-II	inspection	-	Р	V			
			Natabia a Flancia				Piece 1st Piece &			Report.					<del></del>	
		:\	Notching Flange			1st Piece & every		IC-000 D II	IS:802-P-II	Fabricator's		Р	V			
		1)		Major	Measure	50th Piece	every 50th	IS:802-P-II	15:802-P-II	inspection	-	Р	٧			
			Level Cut				Piece 1st Piece &		IS:802-P-II	Report. Fabricator's	-	-	+	-	+	
		i۱	Heel Grinding	Major	Measure	1st Piece & every	every 50th	IS:802-P-II	NTPC Spec./	inspection	L	Р	V			
		1)	i idei Giiridirig	iviajUi	ivicasuie	50th Piece	Piece	10.002-17-11	Approved drgs	Report.	ľ		ľ		1	
		$\vdash$	1		+		FIECE		IS:802-P-II	Fabricator's	╁	-	-	+	+	
		k)	Bending MS	Major	Measure	100%	100%	IS:802-P-II	NTPC Spec./	inspection	1_	Р	V			
		Λ)	Section	wajoi	ivicasuie	10070	10070	10.002-1 -11	Approved drgs	Report.	1		ľ			
	<u> </u>			1	1		1st Piece &		IS:802-P-II	Fabricator's	1			+	+	
		n	Bending MS Plate	Major	Measure	1st Piece & every	every 50th	IS:802-P-II	NTPC Spec./	inspection	_	Р	V			
		"	Donaing Wo Flate	major	I I I I I I I I I I I I I I I I I I I	50th Piece	Piece	10.002 1 11	Approved drgs	Report.	1	ľ	ľ			
							1st Piece &		, approved digo	Fabricator's	╁		-	+	+	
ł		m)	Other dimensions	Major	Measure	1st Piece & every	every 50th	IS:7215	IS:7215	inspection	-	Р	V		1	
		,	2			50th Piece	Piece		1.5	Report.	1	ľ	ľ		1	
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	Welding Procedure Specification	a)	Suitability	Critical	Verify	100%	100%	IS:822 / ASME- SEC-IX	IS:822 / ASME-SEC-	QW-482	<b>√</b>	Р	٧	٧	WPS to be submapproval. Butt jo pipe are not allow	int in lattice and
	Procedure Qualification	a)	Qualification	Critical	Physical	As per IS/ASME- SEC - IX	As per IS/ASME- SEC - IX	-IS:822 / ASME- SEC-IX & WPS	IS:822 / ASME-SEC- IX & WPS	QW-483	<b>√</b>	Р	W	W		
	Welder Performance Qualification	a)	Qualification	Critical	Physical	As per IS/ASME- SEC - IX	As per IS/ASME- SEC - IX	-IS:822 / ASME- SEC-IX & WPS	IS:822 / ASME-SEC- IX & WPS	QW-484	<b>V</b>	Р	w	W		
	======================================	a)	welds size	Major	Physical	100%	10% Random	Approved Dags	Approved Dags	Inspection	√	Р	٧			
		b)	weld Quality	Critical	DPT	100%	10% Random	ASTME-E-165	ASTME-E-165	Records	1	Р	W			
	Inspection of fabrication parts (Black)before galvanising	a)	a) Dimension to 2.1	Major	Measure	IS:2500-P-1 ,AQL, SSP Level-II	IS:2500-P-1 ,AQL, SSP Level-II	Approved Dags IS:802-P-II	Approved Dags IS:802-P-II	Inspection Records	<b>√</b>	Р	w			
		b)	Surface finish	Major	visual	IS:2500-P-1 ,AQL, SSP Level-II	IS:2500-P-1 ,AQL, SSP Level-II	Approved Dags IS:802-P-II	Approved Dags IS:802-P-II	Inspection Records	-	Р	V	-		
	Proto Assembly	a)	Dimensions	Critical	Assembly	100%	One Structure of each type	NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	<b>V</b>	Р	W	W		
		b)	Fit-up/ Fowling/Notching	Critical	Assembly	100%	One Structure of each type	NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	<b>V</b>	Р	W	W		
	Revision of Drawings/Shop sketch on Proto feedback	a)	Revisions of Drawings (For re- approval)	Major	Review	Wherever effected		NTPC Appd Drgs Shop Sketch	NTPC Appd Drgs Shop Sketch	Inspection Records	<b>√</b>	Р	V	V	Revised Drawing submitted for NT	
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	Degreesing	a)	Solution strength	Major	visual	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	V	٧	Galvanising to be	
		b)	PH Value	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	V	٧	Approved Galva	niser only.

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	OPERATIONS				CHECK	6 M	6 C/N	DOCUMENT		RECORD		М	С		
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	Rinsing	a)	Cleanliness	Major	Visual	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	V	Galvanising to be done at NTPC Approved Galvaniser only.
	Picking	a)	Acid Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	1	Р	٧	٧	
		b)	Iron Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	٧	
	Rinsing		Cleanliness(Mill scale paint marks etc.)	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	٧	V	
	Pre-fluxing	a)	Dry fluxing	Major	Chem	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	٧	٧	
		b)	Iron Content	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	V	٧	
		c)	Specific gravity	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	٧	٧	
		d)	pH Value	Major	Chem	1 Sample daily	1 Sample daily	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	V	V	
		e)	Temperature	Major	Measure	Hourly	Hourly	IS:2629	IS:2629	Galvaniser's QC Records	-	Р	٧	٧	
	Pre-Heating		Temperature	Major	Measure	Hourly	Hourly	IS:2629	IS:2629	Galvaniser's QC Records	√	Р	٧	٧	
	Hot Dip Galvanising	a)	Temperature	Major	Measure	Continuous recording & hourly measurement	Continuous recording & hourly measurement	IS:2629	450 C to 475 C	Galvaniser's QC Records	<b>V</b>	Р	V	V	Zinc bath temperature to be recorded continuously on graph &
		b)	Immersion time	Major	Measure	Each lot	Each lot	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	٧	hourly manual recording shall also be done using digital temp.
		c)	Removal of excessive zinc while lifting from zinc bath by bumping process	Major	Physical	Each item	Each item	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	V	V	indicator & actual verification by thermometer
	Quenching in Running water		Cooling & cleaning	Major	Physical	Each item	Each item	IS:2629	IS:2629	Galvaniser's QC Records	√	Р	V	٧	
	Post treatment or Dichromating		Solution Strength	Major	chem	Once in day	Once in day	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	٧	

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	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE	ACCEPTANCE NORMS	FORMAT OF RECORD		A	GEN	CY	REMARKS	
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	checks on member after galvanising	a)	Surface defects & finish	Major	Visual	100%	100%	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	V		
		b)	Thickness of zinc coating	Major	Measure	One Sample/ Shift	One Sample/ Shift	IS:4759 & NTPC Spec & Drg.	IS:4759 & NTPC Spec & Drg.	Galvaniser's QC Records	<b>V</b>	Р	٧	٧		
		C)	Mass of zinc coating	Major	Test	One Sample/ Shift	One Sample/ Shift	IS:6745 & NTPC Spec & Drg.	IS:6745 & NTPC Spec & Drg.	Galvaniser's QC Records	√	Р	٧	٧		
			Uniformity of zinc coating (Preece test)	Major	chem	One Sample/ Shift	One Sample/ Shift	IS:2633	IS:2633	Galvaniser's QC Records	<b>V</b>	Р	٧	V		
		e)	Adhesion test of zinc coating (Pivoted Hammer Test/ Knife test	Major	Physical	One Sample/ Shift	One Sample/ Shift	IS:2629	IS:2629	Galvaniser's QC Records	<b>V</b>	Р	٧	٧		
	Stensiling of Mark/ Number	a)	Marking	Major	Visual	100%	100%	Approved Dags	Approved Dags	Galvaniser's QC Records	<b>V</b>	Р	٧	٧	At both ends wit	h black paint
П	N L N P CT	⊓N														
	Fabricated Menders after Galvanising		Surface finish, Defects & dicromating	Major	Visual	5% Random Sample		IS:2629 IS:4759	IS:2629 IS:4759	Final Insp Report.	-	-	-	-		
		b)	Dimensions	Major	Measure	1% Random sample from each lot offered for inspection on single occasion		IS:802-P-II /Approved Drgs	IS:802-P-II/ Approved Drgs		<b>V</b>	Р	w	W		
	Verification of basic material quality	a)	Chemical composition	Major	Chem	1 Random Sample		NTPC Appd Drgs	NTPC Appd Drgs	Third Party Lab Report	<b>√</b>	Р	V	V	Sample for chen sent for third pa be witnessed at	rty lob or test to
		b)	Tensile test(TS,YS,%E)	Major	Mech	per 40MT or part there of for each class of product		IS:2062, IS:228 IS:1608, IS:1599	IS:2062, IS:228 IS:1608, IS:1599	Fabricator's QC Report	<b>√</b>	Р	w	W		
		c)	Bend Test	Major	Mech			10.1000, 10.1099	13.1000, 10.1033	QO NOPOR	<b>V</b>	Р	W	W		

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□N□	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	6 C/N	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD			GEN		REMARKS
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	Fillet Welding Quality		Weld Quality	Major	Visual	100%		IS:822	IS:822	Fabricator's QC Report	<b>V</b>	Р	W	W	FOR 3.3, W= RANDOM 10% E weld not permitted
	Galvanising	a)	a)Thickness of Zinc Coating	Critical	Measure			IS:2629 & NTPC Spec.	IS:2629 & NTPC Spec.	Fabricator's QC Report	<b>V</b>	Р	W	W	
		b)	Mass of zinc coating	Critical	Measure	-1 Random Sample		IS:6745 & NTPC Spec.	IS:6745 & NTPC	Fabricator's QC Report	<b>V</b>	Р	W	W	
		c)	Uniformity of zinc coating	Critical	Measure	per 40MT or part		IS:2633	IS:2633	Fabricator's QC Report	<b>V</b>	Р	W	W	
		d)	Adhesion test of zinc Coating (Pivoted Hammer/ Knife Test)	Critical	Measure	class of product		IS:2629	IS:2629	Fabricator's QC Report	<b>V</b>	Р	w	W	
	Review of Documents (TC/TR)	a)	Documents review	Major	Review	As Marked in col 9D		As Applicable	As Applicable	As per QA Plan	-	Р	V	٧	
]	PCCINCITORING		Packing	Major	Review	As Marked in col 9D		IS:2629	Pieces of light sections to be wire bundled & heavy sections to be supplied loose. Stacking to have proper ventilation. Damage to be avoided.	As per QA Plan	-	Р	V	V	Sequential supplies to be monitored & insured by main contractor. 2. Material rejected by NTPC shall be kept under separate custody marked with paint till all the supplies are despatched to site or destroyed by cutting Presence of NTPC representative.
	□ ⅢP□TC□		Verification												
		a)	Sequential supplies	Major	Review	100%		Appd Drgs BOM of LOA	Appd Drgs BOM of LOA Packing List	Fabricator's Dispatch	-	Р	٧	٧	
		b)	Stensiling/Part No.												
		c)	Quality								Î				

L□□□N□□□ 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,

C□P□ NTPC SHALL IDENTIFIED IN COLUM "N" AS 'W'.

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1.01	tee Toe or	a)	Chemical Composition	Major	Chemical	1 Sample for 40 MT or Part thereof.		IS:1161	IS:1161	Producer's TC/TR	-	Р	V	V	Steel tp procured from NTPC approved Main Steel Producers & NTPC approved sources only.
		b)	Tensile Test (TS YS & %EL)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:1161	IS:1161	Producer's TC/TR	-	Р	٧	V	
		c)	Flattening Test (above 50NB)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:2328	IS:2328	Producer's TC/TR	-	Р	٧	-	
		d)	Surface finish & defects	Major	Visual Measure	100%		IS:1161	IS:1161	Producer's TC/TR	-	Р	٧	-	
		e)	Dimension Length Thickness, OD, Edge preparation	Major	Visual Measure	100%		IS:1161	IS:1161	Producer's TC/TR	-	Р	٧	-	
1.02	ortioned ortioned ore ection one od Pote	a)	Chemical Composition	Major	Chemical	1 Sample for 40 MT or Part thereof.		IS:2062 IS:228	IS:2062 IS:228	Producer's TC/TR	-	Р	٧	V	Steel tp procured from NTPC approved Main Steel Producers as per the tech spec.
		b)	Tensile Test (TS YS & %EL)	Major	Mechanical	1 Sample for 40 MT or Part thereof.		IS:1608	IS:1608	Producer's TC/TR	-	Р	٧	٧	
		c)	Bend Test	Major	Mechanical	1 Sample for 20 MT or Part thereof.		IS:2062 IS:1599	IS:2062 IS:1599	Producer's TC/TR	-	Р	٧	٧	
		d)	Surface Finish & Defects	Major	Visual	100%		IS:2062	IS:2062	GLST TC/TR	-	Р	٧	-	
		e)	Dimensions	Major	Measure	As per IS:2500 Part I		IS:2062 IS:1852 (For Plates) IS:808 (For Angle)	IS:2062 IS:1852 (For Plates) IS:808 (For Angle)	GLST TC/TR	-	Р	٧	-	
1.03	□ INC		Chemical Composition	Major	Chemical	One Sample for 200 MT		IS:209	IS:209 ZN-99-95%	GLST TC/TR	-	Р	٧	٧	1.03 Co-relation of Material Test Certificate to be maintained
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2.00	N P C C														
2.01	Welding Procedure Specification(WPS)	a)	Suitability	Critical	Review	100%		IS:822 ASME-SEC- IX	IS 802 Part II/ IS 7215/Approved Drawing/Shop Sketches	QW-482	-	Р	V	V	WPS to be submitted for approval. If WPS & WQR is already Approved for other Project then the same shall be verified during inspection and shall be applicable for this project.
2.02	Procedure Qualification Record(PQR)	a)	Qualification	Critical	Test	IS:822, ASME-SEC-IX		WPS	WPS	QW-483	-	Р	٧	٧	As above
2.03	Welder Performance Qualification	a)	Qualification	Critical	Test	IS:822, ASME-SEC-IX		WPS	WPS	QW-484	-	Р	٧	٧	As above

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	OPERATIONS					6 M	6 C/N	DOCUMENT		RECORD		М	С	Ν		
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2.04	Fabrication of Base Plate & other items	a)	Centre line hard punching	Major	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		b)	Drilling/Machining/c hamfering/deburring	Major	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
2.05	Pipe	a)	Centre Line Hand- Punching-Length, edge Preparation	Critical	Visual/Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
2.06	Assembly		Fit up & Tack Welding	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
2.07	Welding		Sequential Welding	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
2.08	Inspection Of Weld		Welding defects	Major												
			(a) Visual	Major	Visual	100% of each Type		NTPC appd Drgs	Free from slag & welding defects.	Inspection Records	-	Р	٧	٧		
			(b) Size	Major	Measure	100% of each Type		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	٧		
			(c) Competences	Major	Visual	100% of each Type		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	٧		
			(d) DPT	Major	NDT	100% of each Type		NTPC appd Drgs	ASTM-E-165	Inspection Records	-	Р	٧	٧		
2.09	Inspection of Welded Pipe Support Structures	a)	Dimensions Hole to Hole, Edge Security	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		b)	(b) Straightness	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		c)	Parallelirity of flanges	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		d)	Perpendicularly of Pipe & base Plate	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		e)	Distortion	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
		f)	Completeness	Major	Measure	100%		NTPC appd Drgs	NTPC appd Drgs	Inspection Records	-	Р	٧	-		
2.10	Proto Assembly	a)	Fit-up/Notching	Major	Measure	1 No Structure of each type		NTPC Appd Drgs & Shop Sketch	NTPC Appd Drgs & Shop Sketch	Inspection Records	-	Р	٧	-		
		b)	Dimension	Major	Measure	1 No Structure of each type		NTPC Appd Drgs & Shop Sketch	NTPC Appd Drgs & Shop Sketch	Inspection Records	-	Р	٧	W		

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			M:TPL	N⊞□□						e Nome					
	रीपीसी	PΒ	Po otooctooo		C N D M N T	. C				□□te□					
N	TPC				C NTPC T	CNCLPC	CITIN								
	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		A	GEN	CY	REMARKS
	OPERATIONS					6 M	6 C/N	DOCUMENT		RECORD		М	С	N	
	2		3	4	5			7	8	9	D*	**	10		11
3.00															3.00 Galvanising to be done of NTPC Approved Galvaniser only.
3.01	Degreasing	a)	Solution Strength	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	٧	3.01 Sample test coupons of each section to be attached with the structure & shall not be deattached till the final inspection is over.
		b)	(b) PH Value	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	-	
3.02	Rinsing	a)	cleanliness	Major	Visual	100%		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	V	-	
		b)	PH Value	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	V	-	
3.03	Pickling	a)	Acid content	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	٧	
		b)	Iron Content	Major	Chemical	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	V	-	
3.04	Rinsing	a)	cleanliness Mill scale	Major	visual	1 Sample per Lot of 100 MT		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	-	
		b)	PH Value	Major	Chem	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	-	
3.05	Fluxing	a)	Specific gravity	Major	Physical	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	٧	
		b)	PH Value	Major	Chemical	Daily		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	-	
3.06	Pre-Heating	c)	Temperature	Major	measure	Hourly		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	V	-	
3.07	Hot-Dip Galvanising	a)	Temperature	Major	measure	Hourly		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	٧	٧	3.07 Calibrated Instrument to be used
		b)	Removal of execevie Zinc While lifting from zinc bath	Major	Physical	Each item		IS 2629	IS 2629	Manufacturer's Format of Record	-	Р	V	V	
3.08	Quenching in Running Water		Cooling & Cleaning	Major	Physical	Each Item		IS:2629	IS:2629	Galvaniser's QC Records	-	Р	-	-	
3.09	Post Treatment or Dichromating	a)	Solution Strength	Major	Physical	Each Item		IS:2629	IS:2629	Galvaniser's QC Records	-	Р	V	٧	

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<u>~</u>	TPC					CONICOL OPOCO	C T N								
	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHEC		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF			GEN		REMARKS
	OFERATIONS					6 M	6 C/N	DOCOMENT		KECOKD		М	С		
	2		3	4	5			7	8	9	D*	**	10		11
3.10	Check on structures after Galvanising	a)	Surface defects & Finish	Major	Chem	Once in a day		ls:4759 & IS:2629	ls:4759 & IS:2629	Galvaniser's QC Records	-	Р	٧	V	
		b)	Survey of Thickness of Zinc Coating by Elecometer	Major	Measure	100%		ls:4759 & IS:2629	ls:4759 & IS:2629	Galvaniser's QC Records	-	Р	V	V	
		c)	Thickness of Zinc Coating	Major	Measure	3 Sample/Lot		ls:4759 & IS:2629	ls:4759 & IS:2629	Galvaniser's QC Records	-	Р	٧	٧	
		d)	Mass of Zinc Coating	Major	Chem	3 Sample/Lot		IS:6745	NTPC Spec.	Galvaniser's QC Records	-	Р	٧	٧	
		e)	Uniformity of Zinc Coating	Major	Chem	3 Sample/Lot		IS:2633	IS:2633	Galvaniser's QC Records	-	Р	٧	٧	
		f)	Adhesion Test of Zinc coating(Pivoted Hammer Test/Knife Test)	Major	Physical	3 Sample/Shift		IS:2629	IS:2629	Galvaniser's QC Records	-	Р	٧	V	
	Finishing		Removal of excessive zinc												
3.11	Stensiling of Mark No/Part number		Marking	Major	Visual	100%		NTPC Appd Drgs.	NTPC Appd Drgs.	Galvaniser's QC Records	-	Р	٧	٧	
	NDL NPCTIN														
												<u> </u>			
4.01	Galvanised steel Pipe support Structure	a)	Surface Finish, defects & dichronating	Critical	Visual	100%		IS:2629 & IS:4759	IS:2629 & IS:4759	Inspection report	-	Р	W	W	(a) Galvanising tests to be carried out on randomly selected samples from the tried up test coupons
		b)	dimensions	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	Р	W	W	(b) Butt Weld not permitted
		c)	Straightness	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	Р	W	W	c) For 4.01, witness shall be 10% on random basis
		d)	Parallelity of Flange	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	Р	W	W	
		e)	Perpendicularity of Pipe & base Plate	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	Р	W	W	
		f)	Distortion	Critical	Measure	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	Р	W	W	
		g)	Completeness	Critical	Visual	100%		IS:802-P-II & NTPC Appd Drg.	IS:802-P-II & NTPC Appd Drg.	Inspection report	-	-	-	-	
		h)	Stenciling of Part no.	Major	Visual	100%		Part Drg.	Part Drg.	Inspection report	-	Р	W	W	

		1_				NICI	<b>T</b> mn nnn	LIT□ PL□N		□PN□□					
			M:TPL	NIIII			•			□e□N□Ⅲ□					
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	COMPONENT & OPERATIONS	СН	ARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD			GEN		REMARKS
	OFERATIONS		T			6 M	6 C/N			KECOKD		М		N	<u> </u>
	2		3	4	5		1	7	8	9	D*	**	10	<u> </u>	11
4.02	Fillet Welding Quality		Weld Quality	Critical	Visual	10%		IS:822	ls:822	Inspection report	-	Р	W	W	
4.03	Galvanising Test	a)	Thickness of Zinc Coating	Critical	Measure	Random Sample from Each Lot		IS:2629 & IS:4759	IS:2629 & IS:4759	Inspection report	-	Р	W	W	
		b)	Mass of Zinc Coating	Critical	Chem	Random Sample from Each Lot		IS:6745	NTPC Spec.	Inspection report	-	Р	W	W	
		c)	Uniformity of Zinc Coating (Preece Test)	Critical	Chem	Random Sample from Each Lot		IS:2633	IS:2633	Inspection report	-	Р	w	W	
		d)	Adhesion Test of Zinc coating (Pivoted Hammer Test/Knife test)	Critical	Physical	Random Sample from Each Lot		IS:2629	IS:2629	Inspection report	-	Р	W	w	
4.04	Review of Documents	a)	Compliance of previous stage	Major	Review	As applicable		As applicable	As applicable	As applicable					СНР
		b)	Sequential Supplies	Major	Review	As applicable		I.O.A	I.O.A	As applicable	-	Р	٧	٧	4.04 Sequential Supplies to be mentioned as per contract & ensured by Main Contractor
4.05	Packing		Packing	Major	Review	100%		Packing List	Packing List	As applicable	-	Р	V	V	5.00 Material rejected by NTPC shall be kept under separated custody duly marked with paint the supplies are despatch to site destroyed by cutting in presence Nap representative
5	Despatch		Verification of Quantity	Major	Packing	100%		BOM & LOA	BOM & LOA	Despatch Record					

L□□□N□□□ 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,

C□P□ NTPC SHALL IDENTIFIED IN COLUM "N" AS 'W'.

CLAUSE NO.			TE	СН	NIC	AL	SPEC	IFIC	CATI	ONS	3		[	ज् <i>रीपी</i> संस्थ	श्री С
_	SQE _10						IGEAI								
	( MCC, PCC, A						E BO						н В	IOTTU	1
	ATTRIBUTES / CHARACTERIS- TICS  ITEMS/ COMPONENT S/ SUB SYSTEM ASSEMBLIY	Make, Model, Type, Rating & TC	Dimensions & Finish	Electrical properties	Mechanical Properties	Chemical properties	Functional & Operational Features as per NTPC Spec.	Item to conform to relevant Standards	Pretreatment as per IS 6005	Paint Shade, Adhesion, Thickness & Finish	Functional Checks	Milli-volt drop Test	IR – HV – IR Test	Degree of Protection Routine test as per NTPC spec	All Routine tests as per NTPC spec. & IS
	Sheet Steel (IS : 513)	Υ	Υ		Υ	Υ		Υ							
	Aluminum Bus bar Material (IS : 5082)	Υ	Υ	Y	Υ	Υ		Υ							
	Copper Bus bar Material (IS : 613)	Υ	Y	Υ	Υ	Υ		Y							
	Support Insulator	Υ	Y	Υ	Υ			Υ							
	Air Circuit Breaker ( IS: 13947)	Υ	Y				Υ	Y			Υ	Υ			Y
	Energy Meters ( IS : 13010, 13779 )	Υ	Y				Υ	Υ			Υ				Υ
	Power & Aux. Contactors (IS: 13947)	Υ	Υ				Υ	Y			Υ				
	Protection & Aux. Relays	Υ	Υ				Υ	Υ			Υ				Υ
	OF 21 MW GANDHAR S		2			_	SPECII	_	_			PAR	T-F		GE 6

CLAUSE NO.			TEC	HNIC	AL SPE	CIFIC	CATIONS		<i>एस</i> №	रीपीमी TPC
	(IS : 3231) (IEC 60255 /									
	EC 61850)									
	Control & Selector Switches ( IS : 13947)	Y	Υ		Y	Y		Y		
	CT's & PT's ( IS 2705 / 3156)	Υ	Υ			Y				Y
	MCCB ( IS : 13947 )	Υ	Y			Υ		Y		
	Indicating Meters ( IS : 1248 )	Υ	Υ		Y	Y		Y		Y
	Indicating Lamps ( IS : 13947 )	Y	Υ		Y	Y		Y		
	Air Break Switches ( IS: 13947)	Υ	Υ		Y	Y		Y		
	Control Terminal Blocks	Υ	Υ		Y	Y				
	OF 21 MW GANDHAR S				ICAL SPE			PAR	T-F	PAGE
PHOTO VOLT	AIC PROJECT IN GUJA	RAT		DOC.	NO: RECS	5-5734-0	004-9(R)	I AIN	. 1	7

CLAUSE NO.			TE	CHI	VIC	AL	SPEC	IFIC	CATI	ONS	<u> </u>		[	जरीर्थ स्ट्राप्ट	[4] C
	( MCC, PCC, A						E BO					PUSI		ITCHG UTTO	
	ATTRIBUTES / CHARACTERIS- TICS  ITEMS/ COMPONENT S/ SUB SYSTEM ASSEMBLIY Fuse ( IS	✓ Make, Model, Type, Rating & TC	≺ Dimensions & Finish	Electrical properties	Mechanical Properties	Chemical properties	Functional & Operational Features as per NTPC Spec.	Item to conform to relevant Standards	Pretreatment as per IS 6005	Paint Shade, Adhesion, Thickness &	Functional Checks	Milli-volt drop Test	IR – HV – IR Test	Degree of Protection Routine test as per NTPC spec	All Routine tests as per NTPC spec. &
	13703) Control Transformer ( IS: 12021)	Y	Υ				Υ	Υ			Υ				Υ
-	Push Buttons ( IS: 4794)	Υ	Υ				Υ	Υ			Υ				
	Transducer ( IEC : 60688)	Υ	Υ				Υ	Υ			Υ				Υ
	MCB ( IS : 8828)	Υ	Υ				Υ	Y			Υ				
	Breaker Handling Trolley	Y	Υ				Υ			Y	Υ				Υ
	Synthetic Rubber Gasket (IS : 11149 )	Υ	Υ		Υ	Υ		Y							

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT

TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)

PART-F

PAGE
8

(IS: 11149)

CLAUSE NO.		TECHNICAL SPE	CIFICATIONS	(t). A	स्रीपीमी ETPC
	LT Y SWITCHGEAR ( IS : 8623 )	Y	Y Y Y	Y	Y
	Notes:				
	a detailed Quality relevant supportin	re list of tests / chece Plan indicating the g documents. · Bought Out Items	practice and pr	ocedure alor	ng with
_					
	OF 21 MW GANDHAR SOLAR AIC PROJECT IN GUJARAT	TECHNICAL SPEC		PART-F	PAGE

CLAUSE NO.			Т	ECH	INIC	AL	SPE	CIF	ICA	TIO	NS		<u> </u>	ਾਜੂਰੀ ਪ੍ਰ NTP	[설] (C
	5) CABLIN	NG, I	EAR	THII	NG,	LIG	нти	NING	PF	ROT	ECT	ION			
MODULE	NO. SQE-16												Page	1 of 1	
ATTRIB CHARA	UTES / CTERISTICS		nc										rd &	ndard	
ITEMS/COMP SUB SYSTI	EMS	Dimension	Paint shade, paint thickness, adhesion	Pre-treatment of sheet	IP protection	Proof load*	Surface finish	Deflection test*	HV & IR	Galvanise Test (If Applicable)	Functional	Bought out items/Bill of material	Routine tests as per relevant standard specification	, -	
Wall Mounte Panel (IS-51 IS:2629, 26	13, IS:5,	Υ	Υ	Υ	Υ		Υ		Υ		Υ	Υ	Υ	Υ	Υ
Switch box/ Receptacles	unction box/	Υ	Υ	Υ	Υ		Υ		Υ	Υ	Υ	Υ	Υ	Υ	Υ
Cable gland	s(BS-6121)	Υ													Υ
Cable lug		Υ													Υ
Lighting wire	e (IS-694)	Υ											Υ		
Flexible con	duits	Υ											Υ		Υ
Conduits (G Epoxy) IS-9 2629, 2633,	537 & IS- 6745	Υ		Υ						Υ			Υ		Υ
	Pipe (IS-458)												Υ		
Cable terming straight thro 13573)	hation & ugh joint (IS	Υ											Υ		Υ
Cable Trays crosses, Fle supports sys accessories 2629,2633,6	stem & IS-513,	Y		Y		Y	Y	Y		Y			Y	Y	Υ
DEVELOPMENT	OF 21 MW GANDHAR AIC PROJECT IN GU				CHNI OC. I							P	ART-F		AGE 12

CLAUSE NO.			TECH	HNIC	AL	SPE	CIF	IC <i>A</i>	ATIO	NS		(	एन. №	វិបារវា rec
Trefoil clam	D	Υ												Υ
GI flats for e	arthing &	Υ	Υ						Υ			Υ		Υ
lighting prot														
	6745, <u>2</u> 633)													
GI wire (IS-		Υ										Υ		
	System (BS											Υ	Υ	Υ
<b>–476</b> )												-	-	-
detailed Quasupporting of 2.* Deflect will be as perabove accerning to the control of the contro	is an indicative ality Plan indicative ality Plan indicative alocuments.  on Test on calcer details given phance tests should be applicable of all items will be	ole tray in the I all be con bence	e praces and NTPC lone of the design of the	Proceed technologies & control	and of L hnic on o cros	pro oad al sp ne s	test becif amp	ure on icat	alon cable tion a	ng wi e tra & ap	th re ys s prov	elevan uppor ed M	t sy QP.	The
	OF 21 MW GANDHAF AIC PROJECT IN GU			ECHNI DOC. I	_	_					P	ART-F	=	PAGE 13

### **TECHNICAL SPECIFICATIONS CLAUSE NO.** 6) Control Cables Sequential marking/ Batch marking/ surface finish/ cable length Attributes / **Characteristics** relevant standard & NTPC specification Anti termite coating on wooden drums ageing on outer sheath & insulation Routine & Acceptance Tests as per Armour coverage, cross over, looseness, gap between two wires Constructional requirements feature as per NTPC specification T.S & elongation before & after Spark Test(as applicable) Dimension/surface finish Lay length & Sequence Chemical Composition Mechanical properties Make, Type & T.C as per relevant standard Electrical properties Thermal stability FRLS Tests Item / Components X Sub System Assembly Υ Copper (IS-8130) Υ Υ Υ PVC insulation Compound (IS: 5831) FRLS PVC Compound Υ Υ (IS-5831, ASTM-D2843, IS10810( Part 58), IEC-60754 Part-1) Υ Extrusion & curing Υ /Manufacturing of Core Core Layind Υ Υ Υ Armour wire/strip Υ Inner sheath Υ Armouring Υ Outer Sheathing Finished Cable (IS-5831, Υ Υ Υ ASTM-D2843, IS10810 (Part 58), IEC-60754 Part-1, IEC 60332 part III cat B) Wooden drum(IS-10418) Υ Υ /Steel Drum Notes: 1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents. 2. Make of all major Bought out items will be subject to NTPC approval.

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT	TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)	PART-F	PAGE 14
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# CLAUSE NO. TECHNICAL SPECIFICATIONS

ROUTINE	E TESTS	Following routine tests drum of finished cables	shall be carried out on each s for all sizes.
1)		Conductor Resistance te	st
2)		High voltage test	
ACCEPT TESTS	ANCE	Following Acceptance to each size of cables, in the	tests shall be carried out on the offered lot.
A) For (	Conduct	or (as per sampling plan me	entioned in IS: 1554)
	1)	Annealing test (Copper)	
	2)	Resistance test	
mention	1.	Measurement of Dimension	18
	2.	Tensile Tests	
	2.	Tensile Tests Elongation Test	
	2. 3. 4.	Tensile Tests Elongation Test Torsion Test	For Round wires only
	2. 3. 4. 5.	Tensile Tests Elongation Test Torsion Test Wrapping Test	
	2. 3. 4.	Tensile Tests Elongation Test Torsion Test	For Round wires only
	2. 3. 4. 5.	Tensile Tests Elongation Test Torsion Test Wrapping Test	For Round wires only
	2. 3. 4. 5. 6.	Tensile Tests Elongation Test Torsion Test Wrapping Test Resistance Test	For Round wires only  For G S wires / Formed wire only
	2. 3. 4. 5. 6. 7.	Tensile Tests Elongation Test Torsion Test Wrapping Test Resistance Test Mass of Zinc coating test	For G S wires / Formed wire only  For G S wires / Formed wire only
	2. 3. 4. 5. 6. 7.	Tensile Tests  Elongation Test  Torsion Test  Wrapping Test  Resistance Test  Mass of Zinc coating test  Uniformity of Zinc coating	For G S wires / Formed wire only  For G S wires / Formed wire only  For G S wires / Formed wire only
	2. 3. 4. 5. 6. 7.	Tensile Tests Elongation Test Torsion Test Wrapping Test Resistance Test Mass of Zinc coating test Uniformity of Zinc coating Adhesion test	For G S wires / Formed wire only  For G S wires / Formed wire only  For G S wires / Formed wire only
C) For P <sup>1</sup> IS: 1554)	2. 3. 4. 5. 6. 7. 8.  9.  10.	Tensile Tests  Elongation Test  Torsion Test  Wrapping Test  Resistance Test  Mass of Zinc coating test  Uniformity of Zinc coating  Adhesion test  Freedom from surface defe	For G S wires / Formed wire only  For G S wires / Formed wire only  For G S wires / Formed wire only
•	2. 3. 4. 5. 6. 7. 8.  9.  10.	Tensile Tests  Elongation Test  Torsion Test  Wrapping Test  Resistance Test  Mass of Zinc coating test  Uniformity of Zinc coating  Adhesion test  Freedom from surface defe	For Round wires only  For G S wires / Formed wire only  For G S wires / Formed wire only  For G S wires / Formed wire only  cts

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT	TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)	PART-F	PAGE 15	
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CLAUSE NO.					LONIOATIONO		M	TPC	
D) Agei	ng te								
		Crite	eria		Condition	Test Requireme	nts	Rei	marks
PVC insulati on & outer sheath:	each lot, s stren agei testi with	ples as per re size of cable hall be tested gth & elongat ng). Tensile & ng shall pref a computeria	s in the for tension (before tension (before tension) to the following tension tensi	offered sile ore ation oe done chine.	All sizes which meet the criteria	The size which has manegative deviation from test report values will be on accelerated ageing. The samples shall be a air oven at temperature 130°c+/- 2°c for 5 hours test-for To 8 shapes	n type pe put test. inaged in e of ts and (continue)	does nace nace ageing	all sizes h had
	corre the T NTP	C. These valu	ues mer ort acce les of Te	ntioned in pted by ensile		tested for TS & elonga Acceptance norms sha per IS.	all be as	criteri out or	a) will be a ageing s per IS.
	the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% of the corresponding values of Type Test report. (Please note that test values should be more than the minimum values indicated in relevant standard).				Sizes which do not meet the criteria	Every size will be put of ageing test as per IS.	on		
E) Follow				ut on co	mpleted cables as	per IS on each size:			
			1)	Insulation	on resistance test (	Volume resistivity metho	od )		
			2)	High vo	Itage test				
F) Follow	ing te	sts shall be o	carried	out on o	nly one size of offe	ered lot (comprising of	all sizes):		
			1)			C insulation and outer sl	heath		
					index test on outer				
					density rating test o				
G) Flamm	ahilit	v test as ner		_	_	n completed cable will	he carried	Out a	- nor
		ling plan:	ILC 003	552 - Fait	i- 3 (Gategory- B) G	in completed cable will	De Carrieu	out a	s pei
				cables of togethe	of one particular type	using composite samplir e (i.e. armoured, unarmo s in line with the IEC. All e covered.	oured) will be	e bund	ched
H) Follow	ina te	sts shall he	carried	on one l	ength of each size	(armoured & unarmou	red) of offer	red lo	t:
,			1)	Constru sequen wires / f batch n	ictional / dimensiona ce of cores, armour formed wires, Seque umber marking	al check, surface finish, le coverage, Gap between ential marking, drum / ou	ength measu	ureme	ent, armour
			2)	Measur	ement of Eccentricit	y & Ovality			<del></del>
		OF 21 MW GA AIC PROJECT				PECIFICATION BID CS-5734-004-9(R)	PART-	F	PAGE 16

### **TECHNICAL SPECIFICATIONS CLAUSE NO.**



# 7) LT Power Cables

+																	1
	Attributes / Characteristics	Make, Type & T.C as er relevant standard	Dimension/surface finish	Mechanical properties	Chemical Composition	Spark Test(as applicable)	Electrical properties	Hot Set Test/ Eccentricity & Ovality	Lay length & Sequence	Armour coverage, cross over, looseness, gap between two wires	Sequential marking/ Batch marking/ surface finish/ cable length	& elongation before & after ageing on outer sheath &	Thermal stability	Anti termite coating on wooden drums	Constructional requirements feature as per NTPC specification	Routine & Acceptance Tests as per relevant standard & NTPC specification	FRLS Tests
ı,	em / Components /	ake,	mer	ech	nen	bark	ectri	ot Se	ay le	mo.	edne	T.S &	herr	nti te	onst	outir ecif	STS.
	Sub System Assembly	Σ	Ö	Σ	$\overline{\circ}$	တွ	Ш	Ĭ	۳	Ā	Š	⊢.	_	Ā	ŏ	ᅑᅉ	臣
	lluminum (IS-8130)	Υ	Υ	Υ	Υ		Υ										
	(LPE Compound (IS-7098)	Υ		Υ			Υ	Υ				Υ					
F	VC insulation Compound	Υ		Υ			Υ					Υ	Υ				
(1	S: 5831)																
F	RLS PVC Compound	Υ		Υ								Υ	Υ				Υ
(1	S-5831, ASTM-D2843,																
	S10810( Part 58),																
	EC-60754 Part-1)		V			V		Υ									
	extrusion & curing  Manufacturing of Core		Υ			Υ		ĭ					Υ				
	PVC / XLPE)																
	Core Laying								Υ								
	rmour wire/strip	Υ	Υ	Υ													
Ir	nner sheath	Υ	Υ														
_	rmouring		Υ							Υ							
	Outer Sheathing		Υ								Υ						
									Υ	Υ	Υ	Υ	Υ		Υ	Υ	Υ
IP	Power Cable (Finished)																
P (1	S-5831, ASTM-D2843,																
(I	S-5831, ASTM-D2843, S10810( Part 58), IEC-																
(I) (S) (A) (A) (B) (A) (A) (B) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B	S-5831, ASTM-D2843, S10810( Part 58), IEC- 0754 Part-1, IEC 60332 art III cat B)																
(I) (S) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	S-5831, ASTM-D2843, S10810( Part 58), IEC- 0754 Part-1, IEC 60332		Υ											Υ	Υ		

- This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
   Make of all major Bought out items will be subject to NTPC approval.

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT	TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)	PART-F	PAGE 17
--	---	--------	------------



CLAUSE NO.						l	NTPC		
		f	inished c	routine tests sha ables for all type					
	3)	(	Conductor	Resistance test					
	4)	ŀ	High volta	ge test					
	ACCEPTESTS  A) For	•	each type	Acceptance test (PVC / XLPE insu	ulated) of cables	s, in the offe			
			1)	Annealing test (C	Copper)				
			2)	Tensile Test ( Al	uminum)				
			3)	Wrapping Test (					
					Aldifillidifij				
			4)	Resistance test					
	B) For <i>A</i> IS: 1554		ormed Wi	res ( If applicable	, , , ,	ing plan me	ntioned in		
			1.	Measurement of	Dimensions				
			2.	Tensile Tests					
			3.	Elongation Test					
			4.	Torsion Test	For	Round wires	only		
			5.	Wrapping Test					
			6.	Resistance Test					
			7.	Mass of Zinc coa wires only	ating test For	G S wires / F	ormed		
			8.	Uniformity of Zing	c coating For	G S wires / F	ormed		
			9.	Adhesion test wires only		G S wires / F	Formed		
			10.	Freedom from su	urface defects				
	C ) For I / 7098)	PVC / XLPE insu	lation & P	PVC Sheath (as pe	er sampling plan	mentioned	in IS: 1554		
			1)	Test for thicknes					
			2)	after ageing see					
			3)	Hot set test	(For X	LPE insulation	on)		
	D) Ageii	ng test:							
		Criteria	1	Condition	Test Requir	ements	Remarks		
	PVC insula tion &	Samples as per IS, from each cables in the off	size of	All sizes which meet the criteria	-	hich has negative	In case the size does not		
	outer sheat h:	shall be tes tensile strengelongation ageing). <b>Tens</b>	ted for gth & (before sile &	- Gritoria	report values on accelerate test. The sample aged in air	will be put d ageing es shall be oven at	meet the requireme nt in accelerate		
		elongation testing shall preferably be done with a computerized machine.  temperature of 130°c+/- do ageing test there age and tested for TS & elongation.  Acceptance norms shall be as per IS.  do ageing test there all sizes (which had met							
DEVELOPMENT	OF 21 MW G	SANDHAR SOLAR	TEC	HNICAL SPECIFIC	CATION BID	PART-F	PAGE		



					18150
	Test report NTPC. The Tensile	with			the criteria) will be put on ageing test as per IS.
	+/ - 15 correspond Type Te (Please no values sho than the	ing values of est report. ote that test uld be more minimum odicated in	Sizes which do not meet the criteria	Every size will be put on ageing test as per IS.	
XLPE insula tion	Samples as ageing test		S, from each size	of cables in the offered lot,wi	ll be put on
E) Foll	owing tests v	vill be carried	out on complete	d cables as per IS on each	size of each
type (P	VC / XLPE in	sulated)		<u> </u>	
	1)	Insulation re	esistance test (Vo	olume resistivity method)	
	2)	High voltage	e test		
1		ı			
	k types)		-	e size of offered lot (compri	ising of all
	k types) 1)	Thermal sta	bility test on PVC	insulation and outer sheath	ising of all
	1) 2)	Thermal sta	bility test on PVC	insulation and outer sheath	ising of all
	1) 2) 3)	Thermal sta Oxygen inde	bility test on PVC ex test on outer sh	insulation and outer sheath neath outer sheath	ising of all
sizes 8	1) 2) 3) 4)	Thermal sta Oxygen inde Smoke dens Acid gas ge	bility test on PVC ex test on outer shaity rating test on one	insulation and outer sheath neath outer sheath uter sheath	
sizes 8	1) 2) 3) 4)	Thermal sta Oxygen inde Smoke dens Acid gas ge as per IEC 60 plan:	bility test on PVC ex test on outer shaity rating test on oneration test on one one of the property of t	insulation and outer sheath peath outer sheath uter sheath tegory- B) on completed ca	ables as per
sizes 8	1) 2) 3) 4) mmability tes	Thermal sta  Oxygen inde  Smoke dens  Acid gas ge  as per IEC 60 plan:  This test wil size; cables unarmoured XLPE insula with the IE unarmoured For one par shall be clu greater thar OD of cab	bility test on PVC ex test on outer shall be carried out us so of one particular PVC insulated, ated) will be bunched. All sizes of cables shall be criticular type, cable bed together in 30 mm shall be bulle having least	insulation and outer sheath puter sheath outer sheath tegory- B) on completed cating composite sampling i.e. is lar type (i.e. armoured Plarmoured XLPE insulated, ched together, as per calcu PVC & XLPE insulated, overed. The swith OD less than or equitouching formation while calcubbed together leaving a diameter. Cable OD shall	rrespective of /C insulated unarmoured 8 ual to 30 mm bles with OE gap equal to be taken as
G) Flan followi	a types)  1) 2) 3) 4) mmability tesing sampling  owing tests s	Thermal sta Oxygen inde Smoke dens Acid gas ge as per IEC 60 plan: This test wil size; cables unarmoured XLPE insula with the IE unarmoured For one par shall be clu greater thar OD of cab nominal ove	bility test on PVC ex test on outer shall be carried out us so of one particular PVC insulated, ated) will be bunceC. All sizes of cables shall be criticular type, cable bed together in 30 mm shall be per all diameter as per size.	insulation and outer sheath puter sheath outer sheath tegory- B) on completed cating composite sampling i.e. is lar type (i.e. armoured Plarmoured XLPE insulated, ched together, as per calcu PVC & XLPE insulated, overed. es with OD less than or equatouching formation while calcubbed together leaving a	rrespective of /C insulated unarmoured & una
G) Flan followi	3) 3) 4) mmability tesing sampling	Thermal sta Oxygen inde Smoke dens Acid gas ge as per IEC 60 plan: This test wil size; cables unarmoured XLPE insula with the IE unarmoured For one par shall be clu greater thar OD of cat nominal ove shall be carrie I lot: Construction measureme consecutive Batch (outer	bility test on PVC ex test on outer shall be carried out us so of one particular type, cable bed together in 30 mm shall be cardled diameter as per one length on the sequence of carmour wires / fixed test on the sequence of carmour wires / fixed test on outer shall be the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of carmour wires / fixed together in the sequence of t	insulation and outer sheath puter sheath outer sampling i.e. is armoured Polar outer out	rrespective of Consulated unarmoured armoured 8 ual to 30 mm bles with OE gap equal to be taken as t. (PVC / XLPE)

# **TECHNICAL SPECIFICATIONS**



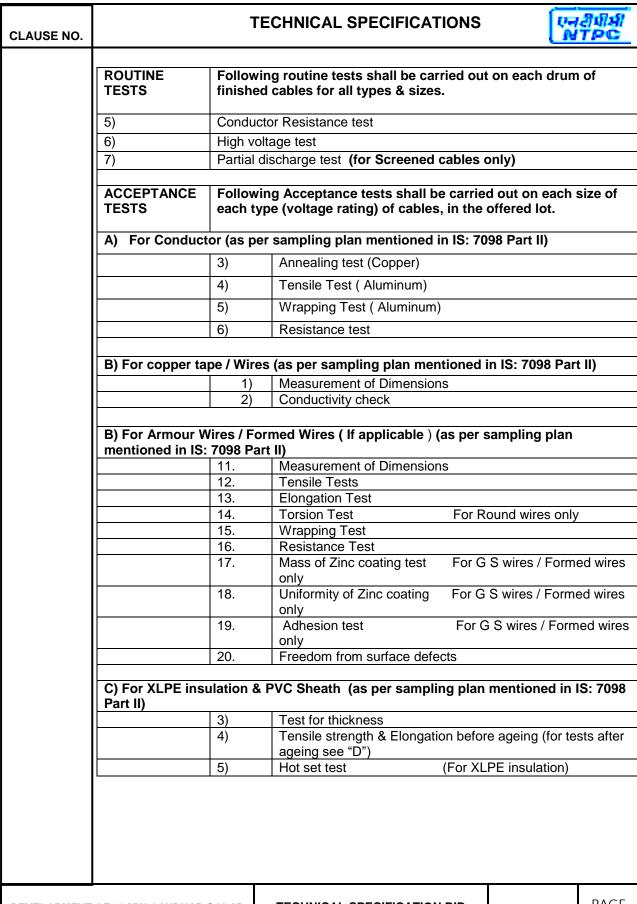
# 8) MV (3.3 kV / 6.6. kV / 11 kV / 33 kV) Cables

	ı		1 1		- 1				1								
Attributes /										gth					ion		
☐ Characteristics										len					fica		
Item / Components / Sub System Assembly	Make, Type & T.C as per relevant standard	Dimension/surface finish	Mechanical properties	Chemical Composition	Spark Test(as applicable)	Electrical properties	Hot Set Test/ Eccentricity & Ovality	Lay length & Sequence	Armour coverage, cross over, looseness, gap between two wires	Sequential marking/ Batch marking/ surface finish/ cable length	T.S & elongation before & after geing on outer sheath &	Thermal stability on outer sheath	Metallic (Cu ) Screening If applicable)	Anti termite coating on wooden drums	Constructional requirements feature as ner NTPC specification	Routine & Acceptance Test as per relevant standard & NTPC specification	FRLS Test
					()			_	۷ ع	0)	_		_	٨	4	ш -	ш
Aluminum (IS-8130)	Y	Υ	Υ	Υ		Υ									_		
Semiconducting	Y		Υ			Υ											
Compound XLPE Compound	Υ		Υ			Υ					Υ						
(IS-7098 Part-II)	ĭ		ĭ			ĭ					Ť						
FRLS PVC Compound	Υ		Υ								Υ	Υ					Υ
(IS-5831, ASTM-D2843, IS10810( Part 58) ,IEC-60754 Part-1)	·										•						•
Triple Extrusion & curing /Manufacturing of Core		Υ			Υ		Υ										
Copper Tape	Υ	Υ	Υ			Υ											
Polyster tape	Υ	Υ	Ш														
Core Laying			Ш					Υ									
Armour wire/strip	Υ	Υ	Υ														
Copper tapping	Υ	Υ	igsquare										Υ				
Inner sheath	Υ	Υ	igsquare												_		
Armouring		Υ	igsquare						Υ						_		
Outer Sheathing		Υ	igwdap	$\sqcup \sqcup$					.,	Υ							
Power Cable								Υ	Υ	Υ	Υ	Υ			Υ	Υ	Υ
(Finished) Wooden drum(IS-		Υ	$\vdash$											Υ	Υ		
rvvooaen arum(15-	1	ΙΫ́	1	1		1	1							Y	Y		i l
10418) /Steel Drum			ļ											٠ ا	١.		

- This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.

  Make of all major Bought out items will be subject to NTPC approval.

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT	TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)	PART-F	PAGE 20
--	---	--------	------------

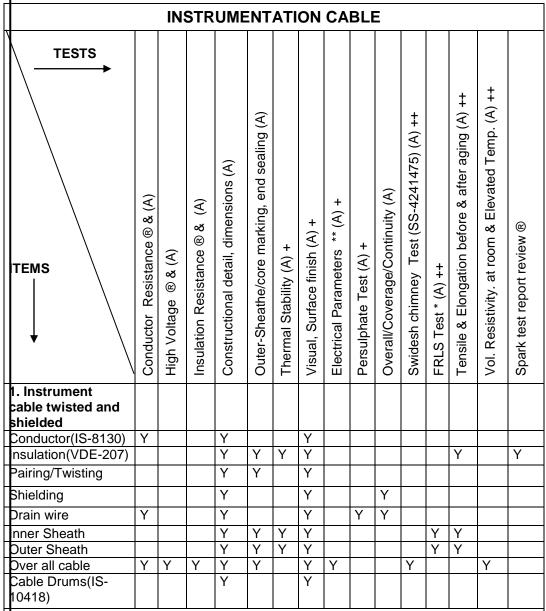




D)	Ageing test:				
	Criteria	Condition	Test Requiremen	ts Rem	narks
PVC outer sheath :	Samples as per relevant IS, from each size of each type (voltage rating) of cables in the offered lot, shall be tested for tensile strength & elongation (before ageing). Tensile & elongation testing shall preferably be done with a computerized machine.  The values will be compared with corresponding values mentioned in the Type Test report accepted by NTPC. These values of Tensile Strength & Elongation (before ageing) should be within +/ - 15% of the corresponding values of Type		For PVC: The size wh has maximum negative deviation from type to report values will be on accelerated ageing test. The samples shad be aged in air oven a temperature of 130°C 2°C for 5 hours and tested for TS & elongation.  Acceptance norms shad be as per IS.	not meet the requirement accelerated test then a criterial won ageing per IS.	ne it in it ageing all sizes id met ti vill be p
	Test report. (Please note that test values should be more than the minimum values indicated in relevan standard).	Sizes which do not meet the criteria	Every size will be put ageing test as per IS		
KLPE Insulation	Samples as per relevant IS, from ea ageing test as per IS.	L ch size of each type (voltag	I ge rating) of cables in th	ne offered lot, will	be put c
=\	Following toots will be corrie	d out an completed cable	os as nor IS on asab s	ize of each type	
≣)		est (Volume resistivity me		ize of each type	
	2) High voltage test	(for Screened cables only	v )		
F)	Following tests shall be carr  1) Thermal stability test of		of offered lot (compris	sing of all sizes &	types)
	2) Oxygen index test on				
	3) Smoke density rating				
	4) Acid gas generation to	est on outer sheath			
		er IEC 60332 - Part- 3 (Ca	• • •		
G)	Following tests shall be carrie	ed on one length of each	size of each type of of	fered lot:	
	coverage, Gap between of drum no. / Batch nu	nsional check, surface finis en two consecutive armour imber of outer sheath extru	wires / formed wires, S		
	2) Measurement of Ecce	ntricity & Ovality			
			T		<u> </u>
_	NT OF 21 MW GANDHAR SOLAR LTAIC PROJECT IN GUJARAT	TECHNICAL SPEC DOC. NO: RECS-		PART-F	PAG 22

### **TECHNICAL SPECIFICATIONS**





Note: High Temp. cables shall be subjected to tests as per VDE-207(Part-6)

Compensating cables shall be checked for Thermal EMF/Endurance test as per IS 8784.

**Note :** This is an indicative list of tests/checks. The manufacture is to furnish a detailed Quality Plan indicating his practice & Procedure along with relevant supporting documents during QP finalization for all items.

Note: ® - Routine Test A - Acceptance Test Y - Test Applicable

Note: Sampling Plan for Acceptance test shall be as per IS 8784 (As applicable)

- \* FRLS Tests: Oxygen / Temp Index ( ASTM D-2863), Smoke Density Rating ( ASTM D 2843), HCL Emission ( IEC-754-1)
- \*\* Characterisitic Impedence, Attenuation, Mutual Capacitance, Cross Talk ( As applicable)
- Sample size will be One No. of each size/type per lot.
- ++ Sample size will be One No. sample for complete lot offered irrespective of size/type.

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT

TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)

PART-F

PAGE 25

### **TECHNICAL SPECIFICATIONS**



11	POWER SUPP	1 Y F()	R CXI	SYS	TFM	S (III	PS/R		FRY	/RAT	TFR	Y CI	1 A R (	GFR	ΔΩΓ	)R/D	CDR	١
4	TESTS		it oai	0.0	. <u></u>	0 (0	0,0	Αι.				. 0.	iAix	<u> </u>	AOL			
l'	TEMS	Visual/dimension/rating/ Paint Adhesion/ Thickness (R)	General arrangement/BOM/make of components //Mimic®	Efficiency ,regulation(R)	Input voltage variation (A)	Out put voltage and frequency adj.range(A)	Premilinary light load test(R)	Load transfer retransfer test (R) *	AC input faliure and return test (R)	Parralel operation and current divison(R)	Relative harmonic content(R)	Restart with PRI A.C and battery (separately)(R)	System transfer and retransfer (R)*	Asynchronous transfer(R)	Ripple content(R)	Load limiter operation (R)	IR/HV(R)	Tests as per standard &specification (R)&(A)
h	JPS/CONVER FER (IEC-146 PT-4)	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
	1																	
5	OLTAGE STABILISER	Υ	Υ	Υ	Υ	Υ					Υ		Υ				Υ	
L E	OLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651	Y	Υ	Υ	Y	Υ					Y		Υ				Υ	Y
L E L ()	OLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651 LEAD ACID BATTERY PLANTE)-IS-	Y	Y	Y	Y	Y					Y		Y				Y	Y
	OLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651 LEAD ACID BATTERY PLANTE)-IS-	Y	Y	Y	Y	Y					Y		Y				Y	
L E L () 1	VOLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651 LEAD ACID BATTERY PLANTE)-IS- 1652 NICKEL CADMIUM BATTERY(IS-	Y	Y	Y	Y	Y					Y		Y				Y	Y
L E () 1 1 S /	OLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651 LEAD ACID BATTERY PLANTE)-IS- 1652 NICKEL CADMIUM BATTERY(IS- 10918/IEC-623) SMF BATTERY ACDB/DCDB	Y	Y	Y	Y	Y					Y		Y				Y	Y
	OLTAGE STABILISER LEAD ACID BATTERY(TUB LAR)-IS-1651 LEAD ACID BATTERY PLANTE)-IS- 1652 NICKEL CADMIUM BATTERY(IS- 10918/IEC-623) SMF BATTERY			Y	Y	Y				Y	Y		Y		Y	Y		Y

\* Transfer time and Over shoot /under shoot during load & system transfer shall be recorded . Note:

1) Detailed procedure of Environmental Stress Screening test shall be as per Quality Assurance Programme in General Technical Conditions

This is an indicative list of tests/checks. The manufacturer is to furnish a detailed quality plan indicating the Practices and Procedure adopted alongwith relevant supporting documents.

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT

**TECHNICAL SPECIFICATION BID** DOC. NO: RECS-5734-004-9(R)

PART-F

**PAGE** 26

CLAUSE NO.	TECHNICAL SPECIFICATIONS										एनशैपीमी NTPC			
		STA	TIO	N LI	GHTI	NG	T	so	QE_1	7	T	T	ı	T
	Item Components Sub System Assembly  Attributes Characteristic	Make, Type , Rating/ TC	Dimension	Pre-Treatment of sheat	Paint Shade Thickness Adhesion & Finish	Galvanization Tests	IP Test	Bought Out Items/ Bill of Material	HV & IR	Functional Check as per spec.	Constructional Feature as per NTP spec	Routine Test as per relevant std and spec	Acceptance Test as per relevant std and spec	Item to conform to relevant standard
	uminaries (IS- 0322 Part-5 sec.1 ( non – ED type)	Υ					Υ		Υ			Y	Y	Υ
E	lectronic Ballast	Υ										Υ	Υ	Υ
L	ighting Wire IS-694)	Υ										Υ		
F	ans (IS-374)	Υ										Υ		
F	ole (IS-2713)	Υ			Υ						Υ	Υ	Υ	
	amps (IS-9800, S-9974)	Υ										Υ	Υ	
( 	ighting Mast with raise & ower lantern ype)	Υ	Υ			Y					Y	Υ	Y	
\ L	Vall Mounted ighting Panel IS-513, IS-5)	Υ	Υ	Υ	Υ	Y	Υ	Υ	Υ	Υ	Y	Υ	Υ	
DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT  TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)  PART-F  32														

CLAUSE NO.	TECHNICAL SPECIFICATIONS													
l .	witch Box/ unction ox/Receptacle / Local Push	Υ	Υ	Υ	Υ	Y	Υ	Y	Υ	Υ	Y	Y	Υ	
	Button Station / ighting Panel IS-513, 2629, 633, 4759, 745)													
	able Gland BS-6121)	Υ	Y									Υ		
8	able Lug (IS- 309)	Υ	Υ									Y		
 	lexible Conduit	Υ										Υ		
-	ighting ransformer (IS- 1171)	Y									Y	Y		
	poxy & Salvanised Conduit (IS- 537, 2629, 633, 4759, 745)	Y	Y									Y		Υ
DEVELOPMENT PHOTO VOLT	VELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT				TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)						PART-F			GE 33

TECHNICAL SPECIFICATIONS CHARGE
13) LED Luminaire Quality Requirements
<ol> <li>LED modules to conform to IS: 16103 part 2. Manufacturer to issue a certificate of compliance for the same.</li> <li>Control gear to conform to IS 15885 part 2 section 13.         Manufacturer to issue a certificate of compliance for the same.</li> <li>LED luminaire to conform to IS 16107 part 2 section 1.         Manufacturer to issue a certificate of compliance for the same.</li> <li>LED luminaire marking to be as per IS 16107 part 2 section 1.         Manufacturer to issue a certificate of compliance for the same.</li> <li>Acceptance tests as per IS 16107 part 2 section 1 to be carried out on LED luminaire except long duration tests i.e. a) Chromaticity coordinates &amp; correlated color temperature (CCT); b) Color rendering index (CRI). Manufacturer will submit a COC for above tests i.e. CCT &amp; CRI</li> <li>LED driver make, model, type &amp; rating may be as per recommendations of LED module manufacturer.</li> </ol>
<ul> <li>Notes:</li> <li>1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.</li> <li>2. Make of all major Bought Out Items will be subject to NTPC approval</li> </ul>

# **TECHNICAL SPECIFICATIONS**



# **15) SWITCHYARD**

Attributes /	Make,	Routine &	Functional
Characteristics	model, Type	Acceptance	requirements as
	& Rating,	Test as per	per NTPC
	Test	IS / IEC	Specification
	Certificate		
Items/Components			
Sub Systems			
Circuit Breaker (IEC:62271-	Υ	Υ	Υ
100)			
Hollow insulator	Y	Υ	Y
(IEC:233/ IS:5621)	Ī	Ī	Ī
Isolator (IEC:62271-102)	Y	Υ	Υ
Current Transformer	Y	Y	
(IEC:60044/BS:3938/IS2705			Υ
/ IEC: 61869)			
Voltage Transformer			
(IEC:186A /	Y	Υ	Y
358/IS3156/IEC60044/ IEC:	'	ı	'
61869)			
Bus Post Insualtor	Y	Υ	Y
(IEC:168 / 815 / IS:2544)	' '	· · · · · · · · · · · · · · · · · · ·	'
Disc,Pin & String Insualtor	Y	Υ	Y
(IEC:383 / IS:731)	·		'
Surge Arrestor (IEC:99-	Υ	Y	Υ
4/IS:3070)			'
Hardware fittings for			
Insulator	Υ	Υ	Υ
(IS:2486 / BS:3288)			
Clamps & Connector	Y	Υ	Y
(IS:10162 / 5561/ 617)	'	'	'
Aluminium Tube	Υ	Υ	Υ
(IS:5082 / 2673 / 2678)			
Conductor (IS:398)	Y	Υ	Y
Galvanised Steel Structures	Υ	Υ	Y
(IS:2062/2629/4759/6745)	-	-	-
Vibration Damper (IS:9708)	Υ	Υ	Υ

DEVELOPMENT OF 21 MW GANDHAR SOLAR PHOTO VOLTAIC PROJECT IN GUJARAT

TECHNICAL SPECIFICATION BID DOC. NO: RECS-5734-004-9(R)

PART-F

PAGE 37

### **TECHNICAL SPECIFICATIONS**



Attributes /	Make, Type	Routine &	Functional		
Characteristics	Rating,and	Acceptance	requirements as		
	Model, Test	Test as per	per NTPC		
	Certificates	relevant	Specification		
	Cortimodico	IS/IEC	op comeanom		
		10/120			
Items/Components					
Sub Systems					
Cas Systems					
Transmission Line Pole					
Transmission Line Pole	Υ	Υ	Y		
Control & Relay Panel	Y	Y	Y		
Protection Relays	Y	Y	Υ		
Event Logger	Y	Υ	Υ		
Time Synchronising	Y	Υ	Υ		
Equipment					
Transmission Line Pole	Υ	Υ	Υ		
	Y	Y	Y		
Relay Test Kit	Y	Y	Υ		
Surge Monitor	Υ	Y	Y		

Notes: 1) This is an indicative list of test/checks. The manufacture is to furnish a detailed

Quality Plan indicating the practice and procedure along with relevant supporting

documents during QP finalisation for all items.

2) All major Bought Out Items will be subject to NTPC approval.

### FIRE EXTINGUISHERS

- a) All fire extinguishers shall be tested as per relevant standard.
- b) Performance / function test shall be carried out on sampling basis as per relevant code / standard.

# CLAUSE NO. TECHNICAL SPECIFICATIONS



16)Energy Meter									
Attributes / Characteristics  tems / Components / Sub- assembly	Make, Model, Type, Rating & Finish	Conform to relevant Standard & NTPC spec	Dimensional check and Paint shade, thickness, adhesion & Finish checks	Complete physical examination for constructional features as per NTPC approved drgs & specification	Burn-In Test and Elevated Temperature Test as per specification	All routine & acceptance tests as per IS 13779			
Electronic Components	Y	Y			ВГ	7.			
PCB for electronic cards	Υ								
Electronic Cards	Y	Υ		Υ	Υ				
Terminal Blocks as per IS 13779	Υ	Y							
nstrument Transformer CTs & PTs ( IS : 2705 & S 3156)	Y	Y							
Sheet Steel ( IS : 513 )	Υ	Υ							
Synthetic Rubber Gaskets S 11149	Y	Υ							
Energy meter S 13779	Y		Υ	Υ	Υ	Y			

### Notes:

- 1. This is an indicative list of tests / checks. The manufacturer is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents.
- 2. Makes of all major Bought Out Items will be subject to NTPC approval.